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COMPUTERWORLD

Developer's exit could further slow Repository

Users skeptical that IBM can fill key CASE holes

BY JOHANNA AMBROSIO
CW STAFF

SAN JOSE, Calif. — IBM's beleaguered Repository Manager blueprint has suffered another setback with the resignation of one of the project's key technical development managers.

Steve Uhlir, manager of Repository development, will officially leave IBM tomorrow, a spokesman confirmed. Uhlir was one of five Repository development managers working out of IBM's Santa Teresa, Calif., laboratory. He had some 70 technical staff members reporting to him.

Uhlir is reportedly jumping to a software development position at Sun Microsystems, Inc. He did not return telephone calls by press time.

The resignation is yet another indication of the technical and political problems that have plagued the development of Repository Manager since its 1989 announcement, some analysts and users said. It is the centerpiece of IBM's computer-aided software engineering strategy known as AD/Cycle. When completed, AD/Cycle will allow users to mix and match software development tools from different vendors.

Despite Uhlir's departure, executives at IBM and the third parties helping to bring the proj-

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LAN manager matchup

COMPUTERWORLD BUYERS' SCORECARD

User satisfaction increased with HP's Openview and IBM's Netview capabilities to manage LANs, but it declined for Sun Microsystem's Sunnet Manager

See Buyers' Scorecard, page 96

Product	Score	
Response base: 98	1991	1992
HP's Openview	69	71
Sun's Sunnet Manager	69	64
IBM's Netview	59	61
Average	66	65
Highest possible score	100	100

Mass. Blue Cross tries EDS Rx

BY NELL MARGOLIS
CW STAFF

BOSTON — Electronic Data Systems Corp. last week landed the biggest health insurance outsourcing deal ever — a 10-year, $800 million-plus contract from technologically ailing Blue Cross/Blue Shield of Massachusetts.

The pact strongly positions EDS to bid for major-player status should a national health care program be implemented.

The contract puts the Dallas-based outsourcing player in charge of Blue Cross' multivendor data center and communications network. In a striking departure from traditional facilities management deals, however, the contract also makes the two organizations full partners in applications development.

Outsourcing elixir?

The $800M Blue Cross/Blue Shield deal requires EDS to:

- **Run data center and manage telecommunications network.**
- **Share applications development following in-house automation fiasco.**
- **Boost competitiveness through cost reduction and operational efficiencies.**

"We're trying to migrate quickly from the traditional health insurance-provider mode to being a world-class provider of total health care management," noted Martin C. Joyce Jr., senior vice president of operations at Blue Cross. Tapping into EDS' well-established technological stronghold, he said, will be key to bridging the gap.

Playing critical role

"This is a bellwether contract," said Alice Lutz, president of EDS' Health and Benefits strategic business unit. Blue Cross "truly believes that technology has an integral and critical role in health care."

The depth of the development partnership is not the only innovative element of last week's deal. The firms are also blazing a trail on the administrative side. A new Office of the

Continued on page 131

DEC'S TROJAN HORSE

Systems integration key to PC strategy

BY SALLY CUSACK
CW STAFF

The flood of red ink flowing from IBM and Digital Equipment Corp. is just one more sign that users are scaling back on large-system purchases in favor of desktop-centric strategies. But while IBM stands as a grizzled veteran of the personal computer wars, DEC is merely a scarred bystander.

A newly reorganized IBM may find some relief in the PC market, but analysts said it is unlikely that DEC will enjoy the same — despite a belated and renewed interest in the Intel Corp.-based desktop.

David Wu, a computer analyst at S. G. Warburg & Co. in New York, said DEC's financial recovery cannot hinge on its entry into the PC market. "Opportunities [here] are too small, and the profit margin is too little, even though PC networking is

Continued on page 130

Outside looking in

DEC's PC share is dwarfed by competitors

Source: Gartner Group, Inc. CW Chart: Janell Genovese

Borland, Microsoft to take on Lotus Notes

BY ROSEMARY HAMILTON
CW STAFF

Although Lotus Development Corp. holds a substantial lead in groupware, it could soon find itself dogged by its traditional — as well as more aggressive — competitors.

Today, Microsoft Corp. and Borland International, Inc. are battling Lotus primarily with words, but they are suggesting that will soon change.

Executives at both companies indicated that the two are plotting to grab chunks of the market by positioning Lotus Notes as a proprietary environment and establishing their own "open" solutions as another approach to work-group computing. Their goal is to appeal to users who are not necessarily sold on the Notes approach.

That will not be easy because Notes is gaining momentum, and Lotus holds significant "mind share" in the groupware market, observers said. Lotus has installed about 90,000 Notes licenses since shipping the product in 1989, and a big piece of its business has come in the last 12 months. As of February 1991, the company had sold 35,000 licenses.

Still, several users contacted recently said they had only begun to explore the groupware concept and will not make product decisions for some time. "I'd like for someone to come out with an alternative" to Lotus, said Joseph Herrin, director of systems development at Joseph

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INSIDE

Sun CEO Scott McNealy took some shots at a prominent alliance at Uniforum. Page 132.

IS management is hit hard by cutbacks at United Technologies. Page 7.

Entry-level additions to DEC's midrange line could help the company fend off IBM's AS/400. Page 16.

Product Spotlight — Do you know what's on your LAN? New tools can tell you. Page 91.

NEWSPAPER

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8 IBM slides **AIX Netview/6000** into the market to create order out of router chaos.

10 Motorola casts its wireless network and hauls in Racotek to market the young company's trunked radio systems.

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133 Data General and **Hewlett-Packard** team up with **D&B Software** to take advantage of the latter's business acumen.

Quotable

"IBM has "cried Repository too often. I can only sell this to my senior management so many times. I have to be darn sure it works before I will try to sell it again."

IRA MORROW
SHEARSON LEHMAN BROTHERS

On the delays dogging the project. See story page 1.

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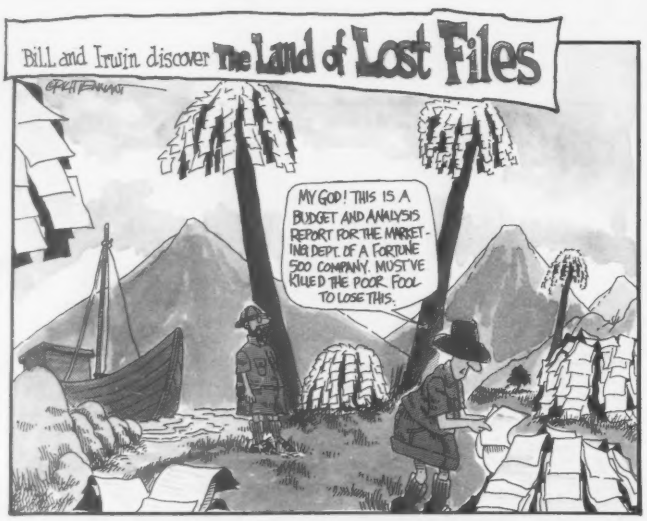

Bill and Irwin discover The Land of Lost Files
MY GOD! THIS IS A BUDGET AND ANALYSIS REPORT FOR THE MARKETING DEPT. OF A FORTUNE 500 COMPANY. MUST'VE KILLED THE POOR FOOL TO LOSE THIS.

EXECUTIVE BRIEFING

■ **The departure of IBM's manager of Repository development** spurs another round of nagging questions about the oft-touted, still elusive blueprint's technological heft and third-party support and raises the specter of lost momentum. **Page 1.**

■ **Comprehensive local-area network management is more** than monitoring hardware and analyzing protocols. There is a slew of day-to-day management tasks that third-party developers are just beginning to address, such as documenting what is on the LAN, backing up and restoring data, monitoring server capacity, preventing viruses and metering software licenses, among others. **Page 91.**

■ **Microsoft and Borland are poised to move into the groupware market** before the year is out, and some users welcome the prospect of alternatives to Lotus' Notes offering. But analysts say raising the number of players to 1-2-3 is unlikely to dislodge Lotus from the top slot. **Page 1.**

■ **A new world of wireless data communications may be on the horizon.** A string of product announcements, including some scheduled for this week's Comnet show, and a recent Federal Communications Commission decision to open up the airwaves for more emerging technologies are generating interest in areas such as mobile data communications. **Pages 67 and 69.**

■ **Massachusetts' largest health care insurer** hands over its foundering informations systems operations to Electronic Data Systems in an $800 million outsourcing deal. **Page 1.**

■ **Hewlett-Packard did more than bring out a few hot new workstations** earlier this month. The company gave a boost to the X Window System. **Page 51.**

■ **Acrimony between information systems folks and users** can undermine a company's business objectives. Try putting the relationship to a test — literally. Through a quiz devised by an IS professional at 3M, IS managers can gauge the level of misunderstanding between the two groups. The results can be used in a joint problem-solving session that could be the key to harmonious coexistence. **Page 103.**

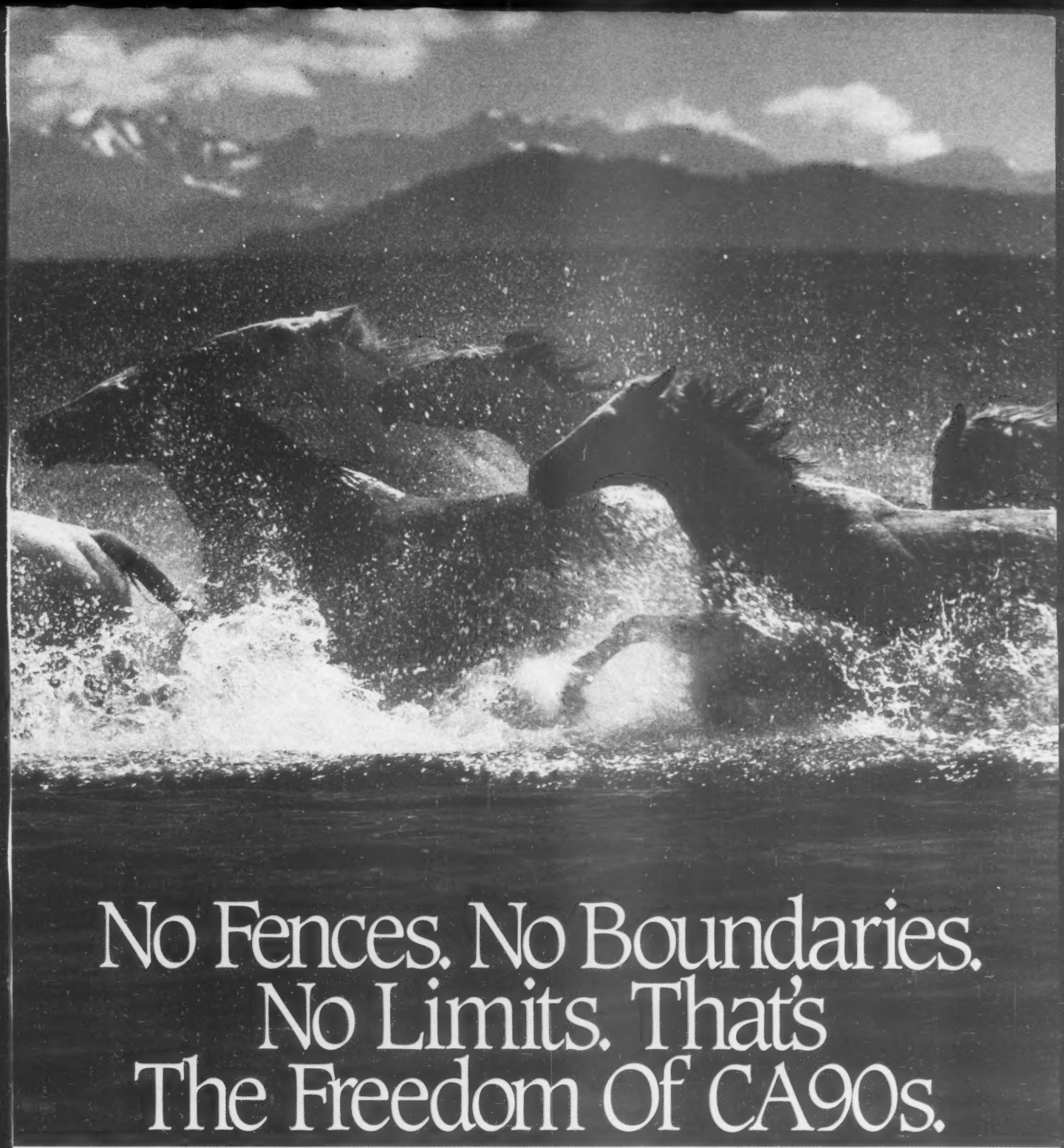
■ **Once more, DEC is setting out for the desktop.** This time, the company is betting on its role as a systems integrator to make it a personal computer player. **Page 1.**

■ **Feeling secure with the niche it has carved for its automated tape library** in the IBM mainframe world, Storage Tek hopes it can find new markets for the robotic tape cartridge system. **Page 29.**

■ **Can Unix win respect in the commercial world?** That question loomed large at last week's Uniforum, where some 40,000 attendees also focused on ease of use, scalability, interoperability and security issues. **Page 132.**

■ **It's a tough time in retail.** IS executives throughout the retail sector gathered recently to find ways to use technology for greater profitability. Meanwhile, specialty retailer Brookstone made a concession to the times by eliminating in-house programming in favor of commercial software, and cut its development staff in half. **Pages 33 and 77.**

■ **On site this week:** T-t-t-tell it to the j-j-j-judge is the word in Los Angeles, where a video image — without the Max Headroom stutter — in a kiosk will be adjudicating traffic and parking ticket cases. **Page 53.** Pizza Hut has been working to cut down on paper and improve efficiency by drawing some suppliers into electronic data interchange partnerships and using an imaging system to process paperwork from its other vendors. **Page 67.** Held up as a model for federal agencies, MCI Communications emphasizes the 'planning' when it comes to capacity planning for its data centers. **Page 31.**



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NT developers breeze through code porting

BY JAMES DALY
CW STAFF

Developers are reporting smooth sailing in their early efforts to port applications over to the still-developing Windows New Technology (NT) operating system, a 32-bit version of Microsoft Corp.'s Windows that is expected to go into beta testing by midyear and ship in early 1993.

"If you're porting GUI code, it's a piece of cake," said Tim Farrell, president of Futuresoft Engineering, Inc. in Houston. Farrell said his engineers ported a Windows 3.0-based 3270 emulation package to NT in less than a week.

Although actual Windows NT applications are still largely a twinkle in developers' eyes, the bedrock code for the final version of Windows NT has stabilized enough in the past six months to allow developers to create solid prototypes.

Microsoft Vice President Paul Maritz will give further briefings on the state of Windows NT at the Windows & OS/2 Conference tomorrow in San Jose, Calif.

Microsoft hopes to have 50 Windows NT applications by April's Comdex/Spring '92, according to Jesse Berst, publisher of the "Windows Watcher" newsletter. NT Version 1.0 will ship by year's end with built-in peer-to-peer networking called Windows Server. The NT team is reportedly talking to third-party utility makers to bundle Norton-style utilities with the new product, he added.

Reason for ease

What eased much of the coding work, many developers said, was the remarkable similarity between the Windows NT and Windows 3.0 application programming interfaces.

"Microsoft seems to have learned from its OS/2 experience, and I don't think they'll ever downplay the issue of compatibility again," said Andrew Singer, president of Enginuity, Inc. in Palo Alto, Calif.

"On the surface, users aren't going to see a whole heck of a lot of difference between Windows NT and Windows 3.0, except Windows NT is a lot more powerful and flexible," said Ray Ozzie, president of Iris Associates, Inc. in Westford, Mass. His firm is crafting a version of Lotus Development Corp.'s Notes for Windows NT.

One complaint, however, is that Windows NT will require at least 8M bytes of random-access memory. "It's not for the meek," one developer said.

Part of Microsoft's early success in the development of Windows NT can be attributed to its Open Process forums, which bring developers into the design schedule up to 18 months earlier than in previous operating system development cycles [CW, Jan. 20].

In these meetings, Microsoft technical personnel present preliminary specifications of Windows NT to independent hardware and software vendors. The third-party vendors may in turn present alternative approaches to the updated operating system.

Microsoft officials said they hope the added input will result in more tightly integrated applications and avert the persistent program crashes that aggravated early users of Windows 3.0.

Developers are highly enthused about their newfound ability for early input. "Everyone benefits from developers having as much feedback as possible in the design loop," Ozzie said.

Compaq squeezes notebook PC prices

BY MICHAEL FITZGERALD
CW STAFF

HOUSTON — Compaq Computer Corp. said it will unveil today a pair of high-performance notebook computers priced well below its traditional premium. Compaq users were impressed, but analysts said the computer maker will face some itchy times as it sheds its old skin.

Compaq's LTE Lite 386/20 and Lite 386/25 are based on Intel Corp.'s 20-MHz and 25-MHz 80386SL power management chips, respectively. Both machines have custom power features that offer up to 45 hours of use, more readable displays than the existing LTE 386S/20 and cursor keys formed in an inverted "T" shape, which address a major annoyance for Compaq customers.

A Johnson & Johnson subsidiary in Raritan, N.J., waited to start a notebook upgrade of its field sales force until it saw the new Compaq products, and the firm said it was worth the wait.

"We let them know what we liked and didn't like [about the LTE 386S/20], and this system meets our requirements," said Carol Norris, information services consultant at Johnson & Johnson subsidiary Ortho Pharmaceutical Corp. She cited lower weight, longer battery life, Compaq's software utilities and the inverted T on the keyboard as specific improvements. Analysts said the new products show a marked improvement in Compaq's approach to the market.

Compaq's new LTE Lites *use a desktop expansion station that also supports the LTE 386S/20*

"Compaq is showing two changes in strategy: underpricing Dell and the other second-tier clone vendors and being much more aggressive in getting products out faster. The question is, with this pricing, can they support their cost structures?" asked George F. Colony, president of Forrester Research, Inc.

The LTE Lite 386/20 will come with 2M bytes of random-access memory, expandable to 10M bytes, and 40M-byte, 60M-byte and 84M-byte hard drive configurations. Pricing will range from $2,899 to $3,599.

The LTE Lite 386/25 has 4M bytes of RAM, expandable to 10M bytes, and comes configured in 60M-, 84M- and 120M-byte fixed-disk versions, priced from $3,699 to $4,699. Both systems claim up to 4½ hours in battery life, though the 386/20 has a Nicad battery, while the 386/25 comes with a nickel-metal hydride battery.

IBM to pump up midrange PC line

BY CAROL HILDEBRAND
CW STAFF

WHITE PLAINS, N.Y. — The first IBM desktop rollout since its grand personal computer reorganization is slated for next month in the form of several midrange boxes based on IBM's proprietary 386SLC chip, according to sources close to the company.

The additions, set for a Feb. 25 unveiling, will beef up the company's midrange PC line, include a 16-MHz 80386SX-based notebook and replace the all-time best-selling Model 55SX. At 2½ years old, it is one of the older stalwarts of the Personal System/2 line. Eventually, the newcomers will also bump out the PS/2 Model 70, sources said.

IBM will offer three upgrade choices: a 20-MHz 386SX-based Model 56 with an upgrade option to IBM's SLC chip, an SLC-based Model 56 and a new Model 57, also with the SLC processor on the motherboard.

The Model 56 can be configured with 4M to 16M bytes of random-access memory and 80M- to 160M-byte hard drives. Also standard are Extended Graphics Array, a three-bay, two-slot configuration and the ability to accept 2.88M-byte floppy disks.

The Model 57 comes similarly featured, but with more expansion capabilities in its four-bay, five-slot configuration. Pricing for the Model 56 will be in line with current Model 55SX pricing, around $2,745 for a model with a 40M-byte drive. Model 57 will run slightly higher, according to sources.

Noted John Dunkle, an analyst at Workgroup Technologies, Inc., in Hampton, N.H., "By bolstering the midrange, IBM is giving [Model 55] users follow-on choices. They're extremely conscious that users want to buy the 386 architecture at a price/performance-oriented scale."

The SLC processor, developed by IBM, puts cache directly on the chip to boost 386SX performance close to the level of a 33-MHz 386DX chip.

European simulcast

The Model 56 has been available on a limited basis in Europe, sources said, but a similar overseas announcement is slated for the same day as the U.S. debut, sources said.

Eventually, the new models reportedly will be sold through such alternative distribution as catalog sales and telemarketing. Winnie Briney, vice president of personal systems marketing, acknowledged that IBM is aggressively looking at both methods of distribution.

While the PS/1 reportedly will be preconfigured with OS/2, Briney said the new models "will not be bundled [with OS/2] in this [first-quarter] time frame."

Analysts were cautious. "That segment is a commodity market, where IBM has typically been a little behind in price/performance. They needed to tactically adjust the line and inject a little performance, and this will help," said Bruce Stephen, a PC analyst at International Data Corp.

Compaq, SGI call it quits

BY CAROL HILDEBRAND
CW STAFF

The bloom is off an April rose following the dissolution of a 9-month-old technology development agreement between Compaq Computer Corp. and Silicon Graphics, Inc.

Last week, the companies announced the end of their deal to co-develop machines based on Mips Computer Systems, Inc.'s reduced instruction set computing architecture because of differences in strategies. However, they will continue to have access to technologies developed prior to the agreement's end.

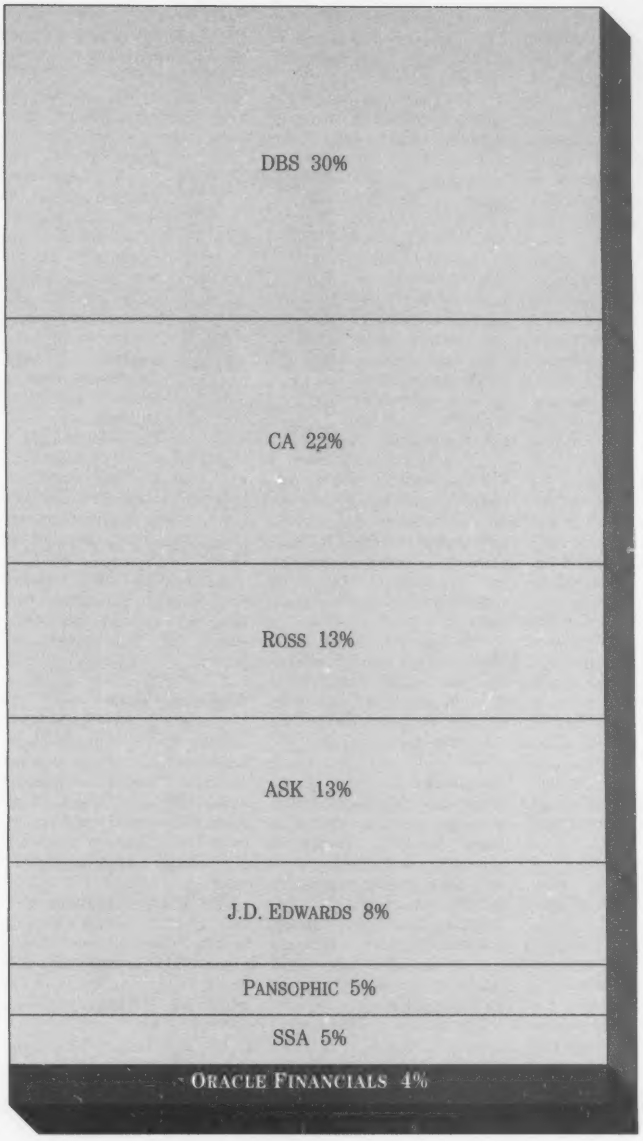
Compaq also ended its investment in the Mountain View, Calif.-based workstation maker. Under terms of the restructuring, Compaq will pay $3.75 million to Silicon Graphics this month, and Silicon Graphics will repurchase the stock bought by Compaq, which totals approximately $150 million.

Silicon Graphics' recent turmoil following the ouster of co-founder Rod Canion had its effect on the agreement, Compaq spokesman Bob Beach acknowledged.

Also, "it became apparent that the more we worked together, the more we found that we really do have very different strategies," he added.

Beach denied that this signaled an end to Compaq's work with the Advanced Computing Environment (ACE) consortium, adding that Silicon Graphics' highly sophisticated workstations were beyond the needs of the commercial market Compaq is focused on. Cost competitiveness and time to market were two other underlying factors, he said.

THE FINANCIAL SOFTWARE MARKET HAS JUST BEEN TURNED UPSIDE DOWN.



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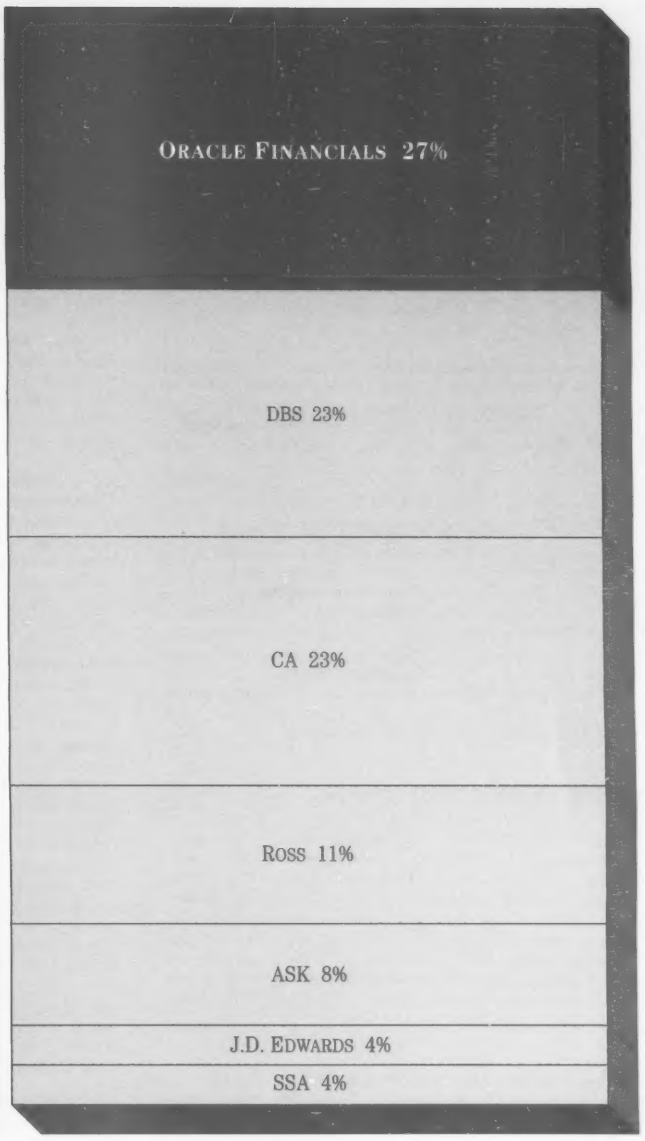

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NEWS SHORTS

Win some . . .

Data General Corp. started fiscal 1992 in the black, barely. DG reported last week a net income of $4 million for 1992's fiscal first quarter, down 68% from $12.4 million in first-quarter 1991. Sales fell more than 5% compared with last year, from $311.7 million to $294.8 million. The company blamed the drop partly on the loss of Japanese revenue, because of the sale last year of its Nippon Data General subsidiary. However, this was its fifth straight profitable quarter after 2½ years of losses, thanks to the increasing popularity of DG's Unix-based Aviion line — sales of which grew 125% in 1991, according to Framingham, Mass.-based market research firm International Data Corp.

. . . . . .

. . . lose some

Wang Laboratories, Inc. reported a $6.8 million loss for the fiscal second quarter of 1992. However, despite a sales slump of 9% from $544.2 million in the second quarter of 1991 to $495.9 million, the quarterly deficit was not as big as the $24.7 million red blotch posted last year at this time. Wang did report an operating income of $3.9 million for the period. Selling off divisions tangential to the company's strategy inflated Wang's income, including the $11 million sale of its Network Services unit. Separately, Wang said it sold its Voice Services Division to Voicecom Systems, Inc. for an undisclosed sum.

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TFLOPS supercomputer planned

Intel Corp. and the U.S. Defense Advanced Research Projects Agency (DARPA) have announced a combined effort to accelerate the development of a supercomputer capable of hitting 1 trillion floating point operations per second (TFLOPS). DARPA will contribute some $21 million over five years to the project through the U.S. High Performance Computing and Communications Program. Supercomputers capable of TFLOPS performance will be needed to tackle global climate modeling, mapping the human genome and analysis and modeling of ground waters and atmosphere, Intel said.

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Chip maker restructures

Chips and Technologies, Inc. will restructure in an effort to focus on microprocessors. The company will make across-the-board cuts of 125 people, or 20% of its staff, by March 1 — above and beyond the 10% it cut last year. It will also attempt to sell its M/Pax multiprocessing architecture. A Chips spokesman said potential customers wanted an entire system, and Chips wants to focus on chip sets. Chips also said its second-quarter results, due out tomorrow, will show a loss "substantially greater" than its first-quarter loss. According to analysts, the restructuring move was necessary for Chips' future viability.

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Madge trounces Soderblom again

The UK Court of Appeal last week reportedly decided in favor of Madge Networks, Inc. in a patent infringement appeal by Token Ring patent holder Olof Soderblom. Madge, a maker of Token Ring products, won the original UK patent suit in June 1990. Soderblom also holds a U.S. patent on basic Token Ring technology and collects royalties from about 50 companies. Madge was the first vendor to challenge the validity of the patent in court; litigation is still pending between Madge and Soderblom in the U.S.

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Unisys posts profit

Unisys Corp. last week posted its first quarterly profit in two years. In the period ended Dec. 31, 1991, Unisys net income was $80.5 million, up from a net loss of $88.5 million for the period a year ago. Operating income also jumped to $200 million, up from $88.3 million a year ago, while inventory levels dropped to slightly more that $1 billion — its lowest since 1986. Revenue for the quarter was $2.46 billion, down from $2.93 billion a year ago. Unisys attributed the drop to market weakness and revenue loss following the June 1991 sale of Timeplex, Inc.

Chase banks on 'info' access

BY ROSEMARY HAMILTON
CW STAFF

NEW YORK — Michael Dacey, an executive vice president of the North American sector at The Chase Manhattan Bank NA here, recently had a client on the phone inquiring about an obscure company in Finland.

It once took as long as a week to research this kind of request and dispatch the information to the customer, Dacey said. This time it took only minutes. While chatting with the client, Dacey tapped into his desktop system and, with a few keystrokes, retrieved reports on the company from one of Chase's databases, printed out a hard copy and faxed it to the impressed client before the end of the phone call.

"It took about six minutes, and I never left my desk," Dacey said.

Keep it confidential

The ability to handle his customer's request was important not only because of the quick turnaround but also because of the confidentiality. Since Dacey handled it himself, outside researchers were not alerted to his client's interest in this firm — a decided competitive advantage.

Dacey was using the Chase Information Exchange (CIX), a key piece of the bank's desktop strategy that has been under way since the late 1980s. CIX was designed in-house through partnerships with numerous computer and information service vendors.

The $1.8 million development effort required the information systems team to pull together a variety of data from different Chase systems and external news and information sources. After a massive integration effort, the information can now be presented to the user on desktop systems in a standard, consistent format.

Less technophobic

The goal behind CIX and the desktop strategy overall is to make Chase's staff more competitive and less technophobic by giving employees easy access to information, said Craig Goldman, Chase's newly appointed chief information officer.

"Any program that required more than two keystrokes to execute I wasn't interested in," said Dacey, who served as a beta tester for the IS department.

The company is standardizing on Lotus Development Corp.'s Notes groupware software, a key element to its work-group strategy as well as another competitive tool, Goldman said. The bank has numerous Notes-based applications, including a client-tracking system that maintains information on accounts.

For example, an account manager can create a document outlining a recent conversation with a client. Co-workers can access that document and share related information that can be used in the next discussion with the client.

The focus on competitive tools is one reason Chase teamed up with several information services vendors.

Goldman said these partnerships allow Chase to work closely with developers and specify certain functions in products. By working with a vendor in the development stage, Chase often gets a working product long before it is generally available to its competitors.

Chase's Goldman *wants a user-friendly desktop*

The bank's implementation of CIX and Notes is also an outgrowth of the strategy to move away from its mainframe-based environment of the 1980s, dominated by "islands of automation," to a desktop-dominated architecture tied to a worldwide network.

"We realized we had many platforms that didn't communicate and many products that were incompatible," Goldman said. Or, as Dacey put it: "We had data but no information."

Key pieces

Today, the key pieces are in place, and the information is at Dacey's fingertips. "We wanted information self-sufficiency at the desktop, and we've achieved that," Goldman said.

Chase is moving its users to a desktop hardware standard based on the Intel Corp. 80386 microprocessor but will be considering I486 boxes.

The bank is moving toward Microsoft Corp.'s Windows environment as its graphical user interface and is upgrading its applications to Windows versions. The Windows selection helps Chase achieve its goal of a consistent, user-friendly front end, Goldman said.

It also provides an opportunity to reevaluate current desktop application standards, he acknowledged.

The bank will continue with three main desktop operating environments, including Microsoft's DOS, IBM's OS/2 and Unix because it has committed to certain applications that were designed for each of those platforms, Goldman said.

"Unfortunately, our vendors haven't evolved to the point of open systems," Goldman explained. "I have certain products that only run on Unix, others that only run on IBM."

Chase kicked off its systems overhaul by standardizing on two local-area network platforms: Novell, Inc. and IBM's LAN Server.

Global network

The bank now runs on a global network of "various technology deployments," incorporating dedicated T1 and leased lines as well as IBM's Systems Network Architecture and Digital Equipment Corp's Decnet. However, the bank is considering frame relay.

This global network provides the critical "highway" to the desktop corporatewide, Goldman said. Chase staffers from a variety of locations can work together via electronic mail or Notes, he added.

Hub central

Chase Manhattan will soon open a major IS center in Brooklyn, N.Y., that will serve as its primary IS hub in the U.S.

Work is near completion at Metrotech, and Chase CEO Craig Goldman expects the facility to open in March. Once it opens, Chase will begin moving 6,000 employees into the new center.

Metrotech will also be a showcase for Chase's GUI-based desktop strategy, Goldman said. Since Chase is starting from scratch at Metrotech, it can ensure that its desktop strategy is implemented in a consistent fashion.

For instance, Intel 386-based systems have been installed, and Chase is implementing E-mail and Lotus' Notes "on every desktop," Goldman said. In addition, Microsoft's Windows will be the standard graphical user interface at Metrotech.

The facility will house "a large segment of our processing capability and a major segment of the staff," Goldman said.

Chase has a similar-size facility in England, he added.

ROSEMARY HAMILTON

Tough times for IS evident at dis-United Technologies

IS staff shrinks by 75% as divisions go their separate ways

BY CLINTON WILDER
CW STAFF

HARTFORD, Conn. — Information systems executives are becoming an endangered species, and that is particularly true for the corporate IS team at United Technologies Corp.

Decentralization, massive cost reduction and a huge data center outsourcing deal have combined to reduce the number of corporate IS executives at United Technologies from a dozen to three in less than a year. Some moved to United Technologies divisions, some are working temporarily for other departments — and some have joined the swelling ranks of executive job seekers.

"I saw a lot less opportunity in the corporate office to provide leadership and direction," said Robert Forte, who recently resigned after 2½ years as director of information services at United Technologies. "I expect the search process to be an interesting one. It's a pretty soft market, and it will probably take a while, but I'm optimistic."

Forte was one of several IS executives who opted for a voluntary severance package at the end of 1991, part of the company's effort to slash 13,900 jobs and $1 billion in costs to survive in the shrinking defense industry. But the paring of centralized IS also reflects a major change in management strategy after the failure of former Vice President of IS John Hammitt's ambitious plan to consolidate IS across United Technologies' diverse business divisions.

Dreams of economy

Hammitt, the high-profile executive who resigned last year, envisioned a huge corporate data center in which United Technologies divisions — multibillion-dollar entities such as Pratt & Whitney, Otis Elevator, Inc. and Sikorsky Aircraft — could gain economies of scale. The data center was built in Newington, Conn., but Hammitt was unable to sell his plan to every division — meaning potential consolidation benefits fell far short of expectations.

Last year — with the data center costs running $5 million over budget by some estimates — the company announced plans to outsource data center operations to Integrated Systems Solutions Corp. (ISSC), IBM's outsourcing subsidiary.

"If John had not started a consolidated data center, there would be no ISSC," said Dave Chzaszcz, who took the severance package after three years as director of corporate MIS. He is currently working on a contract basis with United Technologies' treasury department through April.

With ISSC running the data center and the corporate IS staff cut back, IS management power has essentially been decentralized, passed back to the business divisions. "UTC is making strong moves now to become a holding company as opposed to a management company," Chzaszcz said. "For the next year or two, I don't see much cross-division planning."

Eight executives who once reported to Hammitt have departed or moved to divisions, including Paul Pace, formerly director of IS strategy and planning; Director of Computing Services Pierce Healey, who ran the data center consolidation; and Richard Evans, who was considered Hammitt's right-hand man.

United Technologies no longer has an IS executive at the vice president level. The top executive is Ulf Anderson, director of corporate IS; he could not be reached for comment last week. The rest of the corporate staff consists of Carl Kuhn, who continues to head the telecommunications function, and David Whiteaway, who along with Anderson was transferred from Pratt & Whitney's Canadian operation.

The Newington data center will handle United Technologies' corporate IS and processing for the Sikorsky and Hamilton Standard Co. divisions. Corporate IS is currently processed at data centers at Hamilton Standard and Pratt & Whitney, which declined to follow Hammitt's corporate direction.

Forte saw *fewer chances at United Technologies*

"There was no apparent benefit to Pratt," one Pratt & Whitney IS staff member said. "We already had economies of scale, due to our size."

Chzaszcz noted that few divisions were willing to share in the costs of data center consolidation. "If you have to go to a new software release to get commonality, who pays for that?" he asked. "You're cutting directly into the profitability of that division if you pay. That was the real issue."

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IBM router gets a thumbs-up

BY JOANIE M. WEXLER
CW STAFF

NEW YORK — IBM's debut in the multiprotocol router arena last week raised nary a user eyebrow but drew kudos from analysts who saw far-reaching benefits from the move, including significant IBM market share.

Router basics

IBM filled in gaps last week on its long-expected bridge/router:

Availability: June 1992.
Network support: Token Ring; Ethernet; serial, SDLC, X.25 and frame-relay WANs.
Initially routes: IP-encapsulated SNA, Netbios over Token Ring, TCP/IP, Novell's IPX, Decnet Phase IV, XNS.
Will route: Appletalk II and Netbios over Ethernet (Q3), native SNA through APPN (within two years).
Cost: $9,995 to $18,640.

IBM's announcement of the RISC System/6000-based bridge/router, slated to ship in June (see box), made no mention of performance — a key competitive selling point. The company was similarly vague about when the device would support IBM's own Advanced Peer-to-Peer Networking (APPN) protocols, Fiber Distributed Data Interface networks and source-route transparent bridging.

IBM's low- to midrange routing device does "nothing special if you look at it as just another multiprotocol router," said Todd Dagres, director of data communications research at The Yankee Group, a Boston-based consultancy.

However, he and several other analysts said IBM's blessing of multiprotocol routing over bridging schemes as well as Systems Network Architecture (SNA) encapsulation techniques should help boost the router market in general over the short term — probably to the benefit of its competitors.

Bringing in buyers

Over the long haul, "IBM will open up an entirely new market segment: the stalwart, SNA loyalist who is putting in LANs and doesn't know how to internetwork them," predicted Janet L. Hyland, director of network strategy research at Cambridge, Mass.-based Forrester Research, Inc. She said that by bringing in that new buyer, IBM is likely to capture 35% to 40% of a greatly expanded router market by 1994.

Several users with existing router installations said they see no reason as yet to start peppering their sites with IBM routers. "Unless I saw a huge price difference, clear-cut technological advantage or far superior performance, we wouldn't change," said Andy Marks, manager of data communications at L.A. Gear in Los Angeles.

"I view IBM as a start-up in the routing business," said John Scoggin, supervisor of network operations at Delmarva Power & Light Co. in Newark, Del., which runs a substantial SNA network along with many other protocols. He acknowledged IBM's experience with Transmission Control Protocol/Internet Protocol routing for the National Science Foundation's NFSnet network but said "there have been lots of hardware and software problems. I'd be very cautious."

Another large IBM shop, Austin, Texas-based American Cancer Society, is familiar with the IBM router "but probably won't need it," said Kyle Cooper, senior technical analyst for OS/2 communications. The reasons are a sparse array of disparate protocols — just SNA and Novell, Inc. IPX — and a decision to design its applications around IBM's Advanced Program-to-Program Communications, which allows IBM devices to communicate directly with each other. "That's all we need," Cooper said.

When IBM's router is enhanced to provide native SNA routing through APPN, IBM's scheme for coordinating resources among computing devices communicating directly with each other, "that's conceivably where they'll make their mark," Dagres said.

APPN support on the router is currently a statement of direction, said Jon Fjeld, IBM's product manager of network routing systems. In IBM parlance, that means delivery within two years. He said IBM intends to license APPN Network Node code to other router vendors around mid-1992. Router makers Cisco Systems, Inc., Wellfleet and Proteon, Inc. have said they will license APPN when it is available.

Analysts agreed that the router symbolizes a more "open" IBM. "This product doesn't demonstrate the typical shackles of IBM architectures and religious arguments," Hyland said. She linked such pragmatic decisions as not supporting APPN today as reflective of the December-reorganized IBM that "competes more tactically, product by product instead of with galactic architectures."

Frank Dzubeck, president of Communications Network Architects, Inc. in Washington, D.C., added, "For the first time in history, IBM released a Decnet protocol. Maybe IBM's statement about openness is more than just a marketing term."

Calling on Callpath

IBM last week replaced its Callpath Host offering with Callpath Call Coordinator CICS/MVS, a set of call management facilities linking IBM CICS-based applications with telephone calls. CICS is IBM's widely used database management software.

The fledgling Call Coordinator must be used with existing Callpath/CICS software. It was designed for IBM System/370 and 390 mainframes and will be compatible with multiple vendors' telephone switches in September. These include the Rolm 9750, AT&T Generic 2, Northern Telecom, Inc. SL-1 and the Siemens-Hicom 300, IBM said.

The product will reportedly provide basic inbound and outbound functions, including call data collection and scheduling of outbound callbacks. Users can also customize the software for greater functionality, including telephone load balancing.

Jim Anderson, IBM's manager for Callpath solutions, said Call Coordinator "supersedes the 1989 product that worked only with Rolm switches and had limited inbound functions and no outbound functions."

Callpath is IBM's computer-aided telephony software that integrates telephone calls traveling through customers' private branch exchanges with company databases. The merging of the data with calls is aimed at enhancing productivity in customer service environments. There are about two dozen Callpath sites today, IBM said.

Callpath is available on IBM mainframe, Application System/400 and Personal System/2 platforms. IBM is looking at the PS/2 for Call Coordinator, Anderson said, but currently has no plans to enhance Callpath 400.

JOANIE M. WEXLER

IBM launches SNMP ship with Netview anchor

BY ELISABETH HORWITT
CW STAFF

NEW YORK — IBM last week not only integrated SNA, TCP/IP and Ethernet connectivity into a single router but also introduced a full-function, graphics-based, Simple Network Management Protocol (SNMP)-based system to manage the resulting hodgepodge.

What may prove less propitious, industry analysts said, is IBM's stated intention of unleashing its AIX Netview/6000 into the free-for-all of today's internetworked local-area network management market.

AIX Netview/6000 is a graphics-based system that runs on the RISC System/6000 AIX platform and was designed to manage Transmission Control Protocol/Internet Protocol (TCP/IP) and Ethernet LANs and routers, as well as other devices that support the SNMP protocol, IBM said. The product incorporates pieces of Hewlett-Packard Co.'s Openview network management platform, under an agreement announced by the two vendors last year.

The product replaces IBM's existing AIX Network Manager/6000, which had similar capabilities but far less functionality, an IBM spokesperson said. IBM will continue to support the earlier product.

IBM product manager Sanjiv Ahuja cited three features that he claimed differentiate System/6000 from competing SNMP systems, including HP's: an especially friendly graphics-based user interface based on the Open Software Foundation's (OSF) Motif; management of IBM's AIX systems; and a bidirectional link to IBM's Netview.

The link to Netview allows System/6000 alerts to be correlated with Netview's Systems Network Architecture (SNA) management data, as well as with incoming Token Ring LAN alerts from IBM's LAN Manager, Ahuja said.

The Netview link is unlikely to help sell System/6000 to the majority of "Internet environments managed by SNMP, which are typically in the hands of a bunch of engineers — not the guys in the glass house," said David Passmore, a partner at Ernst & Young. However, the link — and Netview/6000 — may gain popularity as more companies start looking seriously at integrating their non-IBM LANs and routers and SNA backbones, he added.

One company eyeing Netview/6000 is The Travelers Corp. The company is looking for an integrated way to manage a router backbone that will interconnect its IBM Token Ring LANs and also handle SNA traffic. However, The Travelers said it dislikes the prospect of having to install two LAN management systems — LAN Network Manager for the Token Rings and Netview/6000 for the SNMP-based routers — as well as Netview, according to Robin Layland, manager of SNA software engineering.

DHL Worldwide Express, a "mixed Unix shop" with a significant AIX installation, is "very interested in reviewing" both System/6000 and HP's Network Node Manager, according to John Payne, a communications architect at DHL. A major concern for DHL is being able to run whatever network management applications it chooses on whatever integrated mangement system it selects, Payne said.

Application support is one area that IBM plans to expand on in future System/6000 announcements, Ahuja said. IBM is now working with several undisclosed independent software vendors to provide System/6000 for their products, he added. Longer term, the system will conform with the OSF's Distributed Management Environment. Potentially, this would mean that different network management systems such as IBM's and HP's will be able to share applications and databases.

Ten vendors announced participation in a program to allow their devices to be managed by Netview/6000. They include Proteon, Inc., Synoptics Communications, Inc., Wellfleet Communications, Inc., Chipcom Corp., Network Equipment Technologies, Inc. and HP.

AIX System/6000 is set to ship in June with a $9,950 one-time charge.

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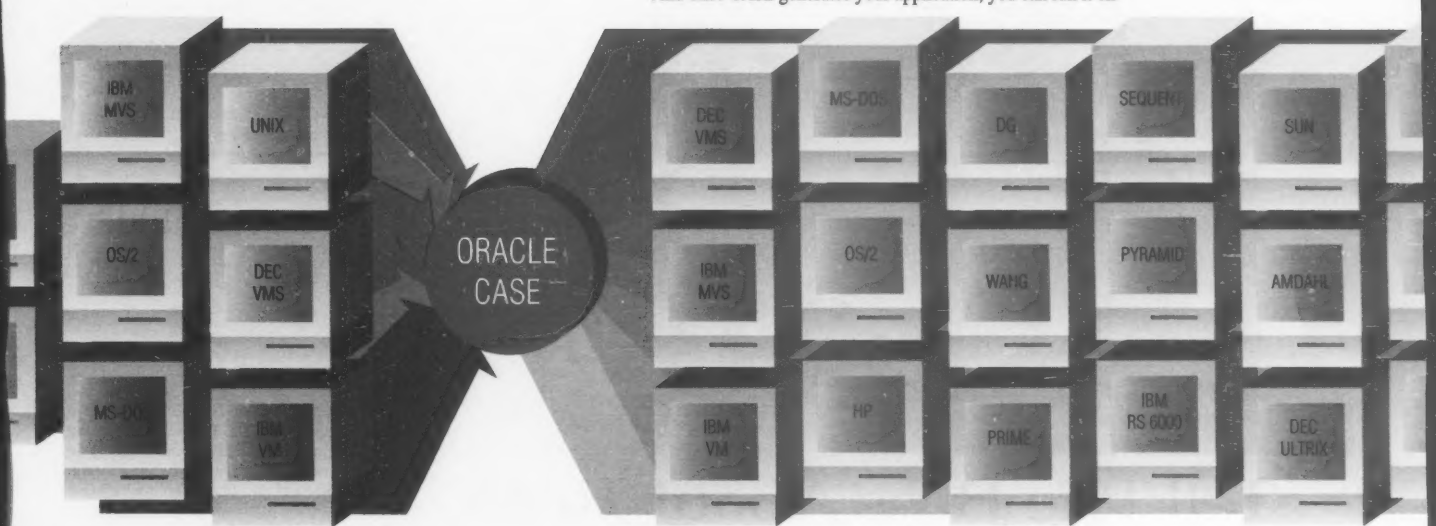

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E-mail 'Bill of Rights' issued for X.500 users

BY ELLIS BOOKER
CW STAFF

TAMPA, Fla. — While they yearn for the sort of coordinated, global directory defined by the emerging international X.500 standard, many electronic mail users worry that this so-called Public Directory, which will contain information from both public and private E-mail systems, could compromise individual or corporate privacy.

Hoping to allay these fears even before X.500 becomes a reality, the North American Directory Forum (NADF) last week published what it called a "User Bill of Rights" for entries and listings in the X.500 Public Directory.

"All the [NADF] members agreed we should highlight to the user community what their privacy rights will be," said Gary Rowe, chairman of NADF's security and privacy subgroup and core services director at AT&T Easylink Services. Incoming members of NADF, a consortium of 17 of the largest E-mail network providers, will be expected to honor the rules, he said.

"This kind of step certainly should be reassuring to individuals [concerned] about the privacy of their mailboxes," said Walter E. Ulrich, a director and E-mail industry consultant at Arthur D. Little, Inc.

However, Ulrich went on to say that "for corporations, the real question is not what's to be listed, but how it is accessed." For example, he said, corporate customers may want to give their trading partners fairly free access into their internal employee directory but restrict this to head-hunting firms.

However, Howard Maynard, senior vice president of MIS at Young & Rubicam, Inc., said he was not concerned about this access issue and argued that companies will probably treat their Public Directory listings much as they treat telephone numbers today.

The advertising giant was an early adopter of the X.400 electronic messaging interconnection standard; it installed a native X.400 local-area network in 1989.

Still, Maynard said he was concerned that the NADF rules do not seem to encompass the global E-mail environment — a special concern to Young & Rubicam, which has offices in 45 countries.

Seven up

The seven X.500 "rights" enumerated by the NADF are as follows:

- The right not to be listed.
- The right to have you or your agent informed when your entry is created.
- The right to examine your entry.
- The right to correct inaccurate information in your entry.
- The right to remote access of information from your entry.
- The right to be assured that your listing in the Public Directory will comply with U.S. or Canadian law regulating privacy or access to information.
- The right to expect timely fulfillment of these rights.

Motorola builds on wireless MAN

BY ELLIS BOOKER
CW STAFF

SCHAUMBURG, Ill. — Motorola, Inc. last week broadened its already substantial presence in the wireless networking arena, by announcing it had reached an agreement with Racotek, Inc. to develop and market the firm's technology for transmitting data over trunked radio systems.

Based in Minneapolis, 3-year-old Racotek already claims a handful of customers for its Raconet, a wireless metropolitan-area network (MAN) for voice and data that links mobile workers with their offices. Racotek's system puts data channels on top of the voice channels carried on Motorola's Specialized Mobile Radio (SMR) systems. The SMRs work at 800 MHz and 900 MHz and are available in some 1,100 locations nationwide.

Motorola said it will produce two-way radio modems designed to work with the Raconet. Customer field trials of the wireless MAN will begin later this year, the company said.

The Raconet MAN will be Motorola's third wireless network venture. In mid-1990, Motorola and IBM launched Advanced Radio Data Information Services, a nationwide, two-way packet radio data service that claims some 35 corporate customers. In March, Motorola will switch on Electronic Mail Broadcast to a Roaming Computer, or Embarc, its nationwide, one-way radio system for sending E-mail to mobile workers.

Financial details of the Motorola/Racotek partnership where not disclosed.

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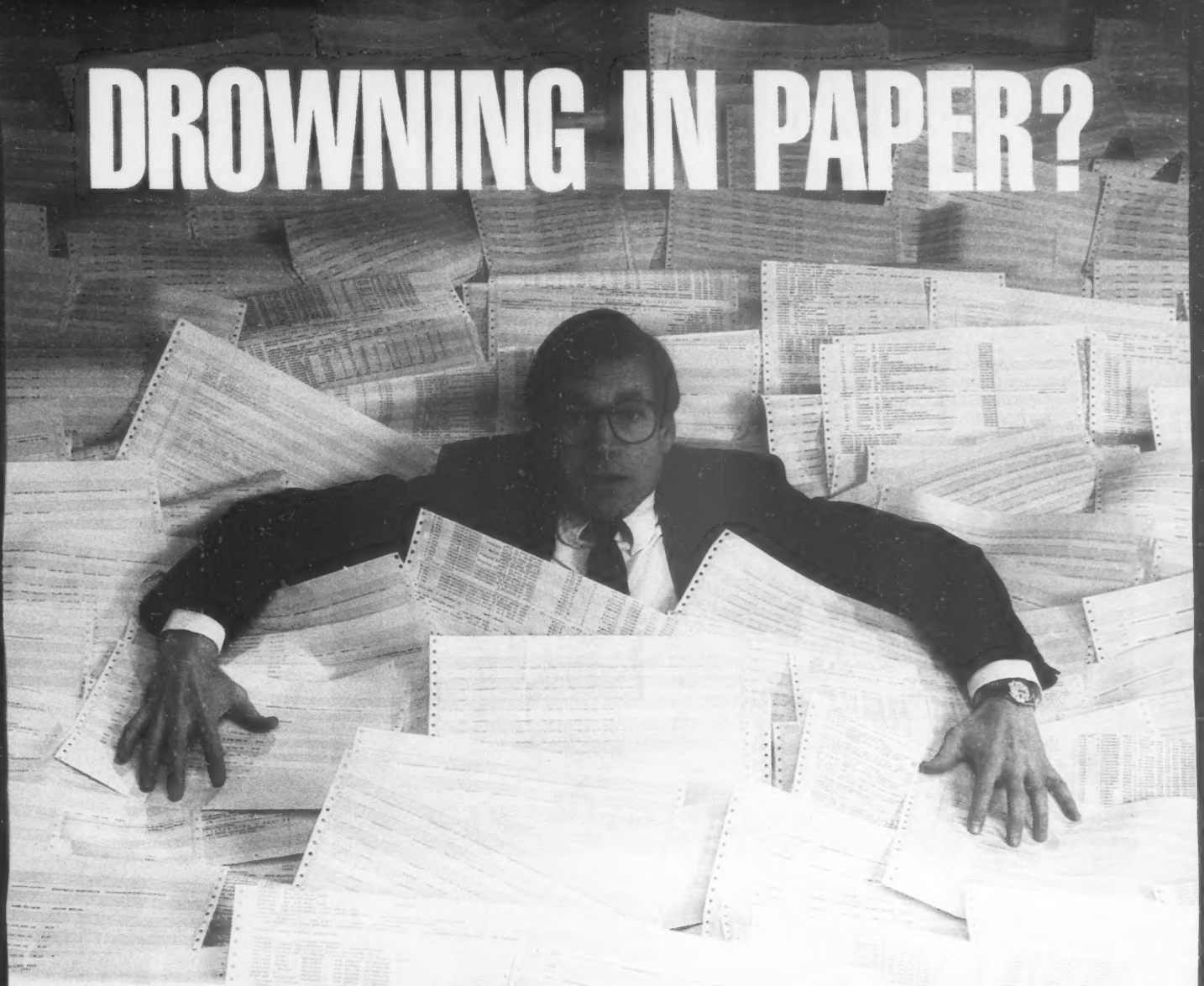

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State seeks to tax mail-order sales

Ruling could lead smaller firms to increase costs, forcing customers to seek alternatives

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — The U.S. Supreme Court last week heard final arguments in a high-stakes case that may determine whether small mail-order computer vendors can keep their price advantage.

The case before the court pits Quill Corp., an office products catalog vendor based in Lincolnshire, Ill., against the state of North Dakota. At issue is North Dakota's law requiring out-of-state mail-order companies to collect a 5% sales tax.

The court's decision is expected by June.

Under a 1967 ruling known as *Bellas Hess*, sales tax is charged only if the mail-order company has a "physical presence" in the state, such as an office, store or other facility. Many revenue-hungry states want to overturn that ruling in order to levy a tax on virtually all mail-order purchases.

If North Dakota wins the pending Supreme Court case, all states will be able to force out-of-state mail-order houses to collect taxes. This would raise customers' final costs and reduce the price advantage of mail order, according to Chuck Barney, an industry analyst at International Data Corp. in Framingham, Mass.

Customer will pay

Because of their lean profit margins, mail-order personal computer vendors cannot further cut prices to offset the taxes, so the "tax hit" will land fully on customers, Barney said. That may nudge users toward other channels, such as superstores, and reduce mail-order company profits, he added [CW, Oct. 21, 1991].

There would be only minimal impact on large mail-order vendors such as Dell Computer Corp. and Compuadd Corp., both in Austin, Texas. The firms have retail stores in many states and already charge state taxes.

Jeffery Davidson, controller at Phillips Properties, Inc. in McAllen, Texas, said he does not mind paying the tax for mail-order PCs, but he predicted that small mail-order firms would be hurt. "We will see serious consolidation in that area," he said.

Small companies such as Microprose Software, Inc. in Hunt Valley, Md., and Personal Computing Tools, Inc. in Los Gatos, Calif., were part of a coalition of direct marketers that opposed North Dakota's tax law.

The Quill case involves the constitutional principle that states should not impose taxes on interstate commerce unless the state has some relation to the business.

North Dakota officials said the "physical presence" test is outdated because of the emergence of such long-distance shopping options as catalogs, telemarketing and videotex.

North Dakota argued for a looser "economic presence" test, which would apply state taxes if the mail-order company solicits business in the state.

Creating problems

The Direct Marketing Association (DMA), which opposes the law, argued that it would be an administrative nightmare to calculate and collect taxes in the nation's 6,000 taxing jurisdictions, which have different tax rates, exemptions and filing rules.

North Dakota countered that today's computerized accounting systems can handle the job.

Vertex, Inc. in Berwyn, Pa., for example, markets a multistate tax-compliance software package for $15,000 to $20,000, according to company President Ray Westphal. However, the DMA said that price is too steep for small mom-and-pop mail-order companies.

State officials and their allies complained that mail-order firms have an unfair advantage over local merchants, who must charge sales taxes.

Staff writer Carol Hildebrand contributed to this report.

Where's the check?

Despite potential legal obstacles, the PC mail-order business will comprise 30% of all indirect sales by 1995, up from 24% last year

Value of U.S. PC and workstation sales through the mail-order channel

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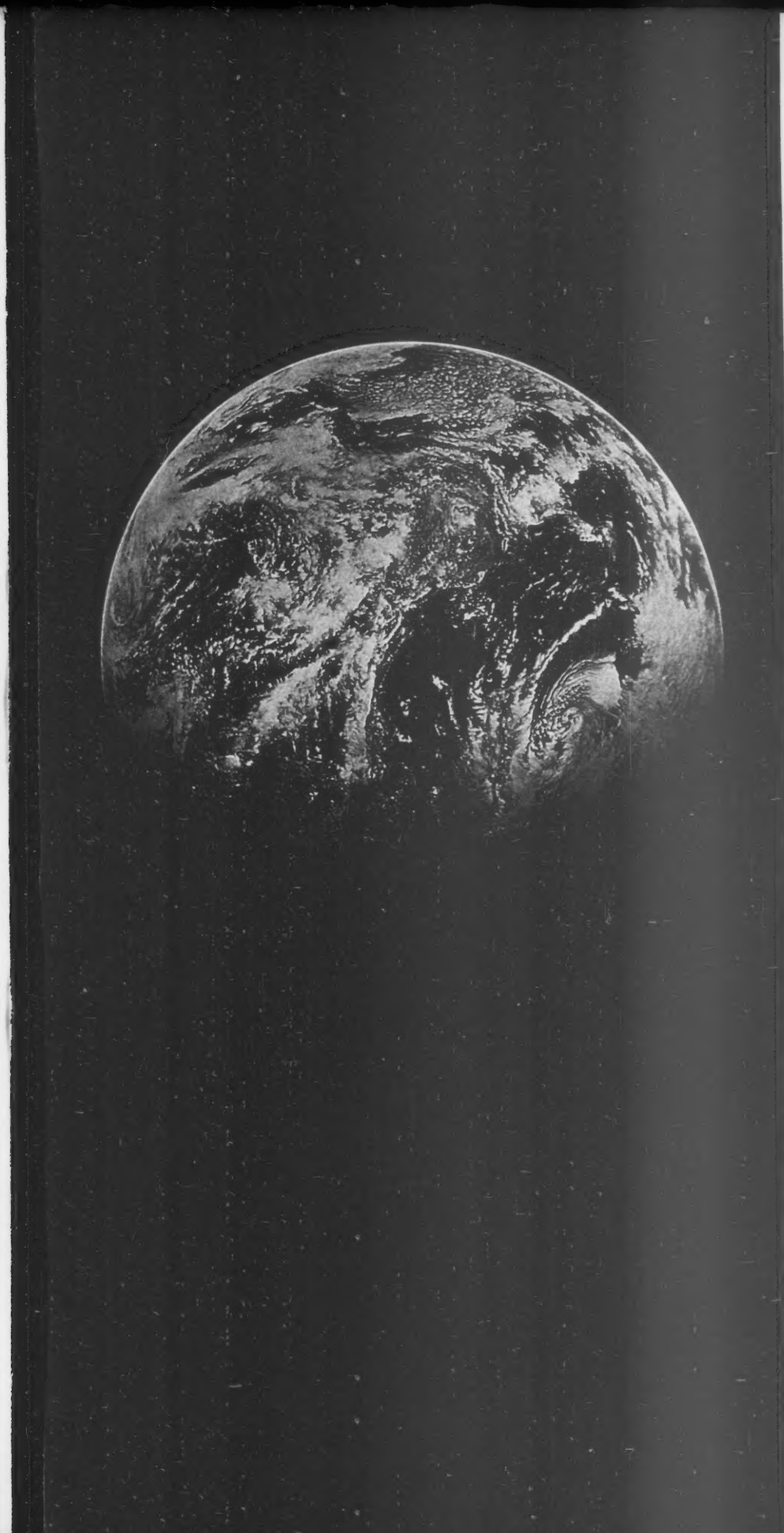

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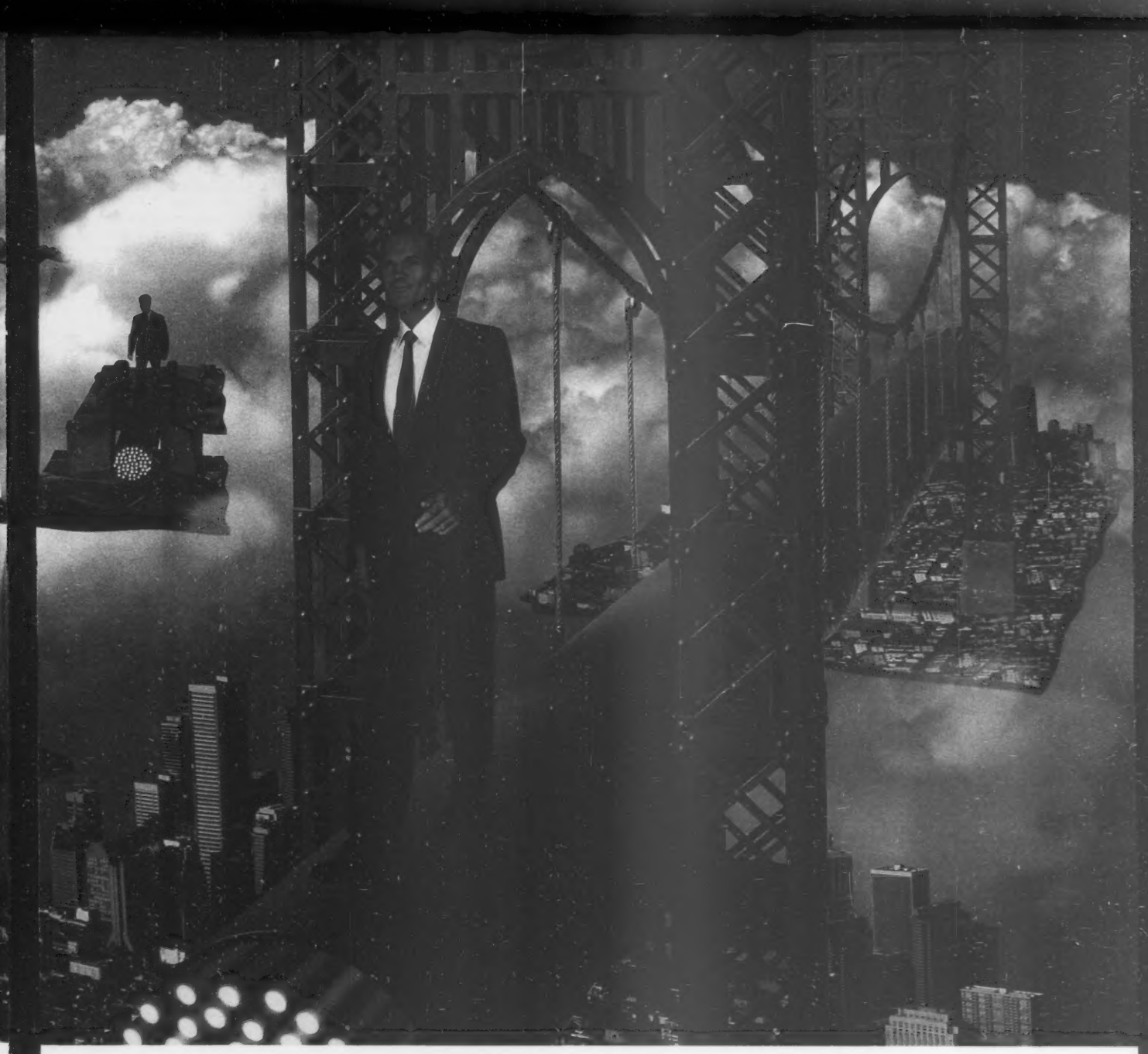

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The right choice.

DEC aims to lower midrange entry costs

BY SALLY CUSACK
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp. is expected to extend its Microvax 3100 line tomorrow with low-end models that are said to significantly lower the cost of entry into midrange computer systems.

DEC will unveil two 5-VAX Units of Performance (VUP) machines, capable of an estimated 21.6 transactions/sec. based on the A-Level benchmark from the Transaction Processing Council, a consortium of major industry vendors. The systems, Models 30 and 40, will be priced at approximately $8,800 and $11,500, respectively.

The new systems replace the Model 20E, sources said.

In addition, DEC will unveil the Model 80, a 10-VUP system that has been tested at 27.9 transactions/sec., sources said. Its price tag hovers at about the $18,000 mark.

The price of the existing 3100 Model 10E will be cut to approximately $6,300, roughly a $1,000 reduction.

With the new systems, DEC will also offer a higher performance small computer systems interface that performs at 4M byte/sec.

The vendor is continuing its push toward "smaller, faster and cheaper" in the midrange computing market, said Wes Melling, an analyst at Gartner Group, Inc. in Stamford, Conn.

DEC's Microvax 3100 series machines are used most often to run distributed applications and thus compete most directly with IBM's Application System/400.

Currently, the low-end AS/400 B35 offers about 10 transactions/sec. at a cost of $18,662 per transaction, while the DEC Model 30 comes in at approximately $10,900; the DEC Model 40 at $10,969; and the DEC Model 80 at $10,166.

One DEC user, John Claxton, manager of systems and networks at Insteel Industries, Inc. in Mount Airy, N.C., said the price/performance of the new 3100s will allow him to consider purchasing the new boxes as more drawn wire mills are added to his data processing network. He will then to move the older DEC systems into smaller sites.

DEC is also expected to announce three separate interfaces to Posix under VMS.

Blue wave

Not to be outdone in the midrange arena, industry insiders claim IBM will soon introduce its next-generation AS/400 systems — the E series — perhaps as early as next month.

The E series would replace the current top-of-the-line D series models in price/performance by offering a faster processor for approximately the same $12,000 entry price as the D2.

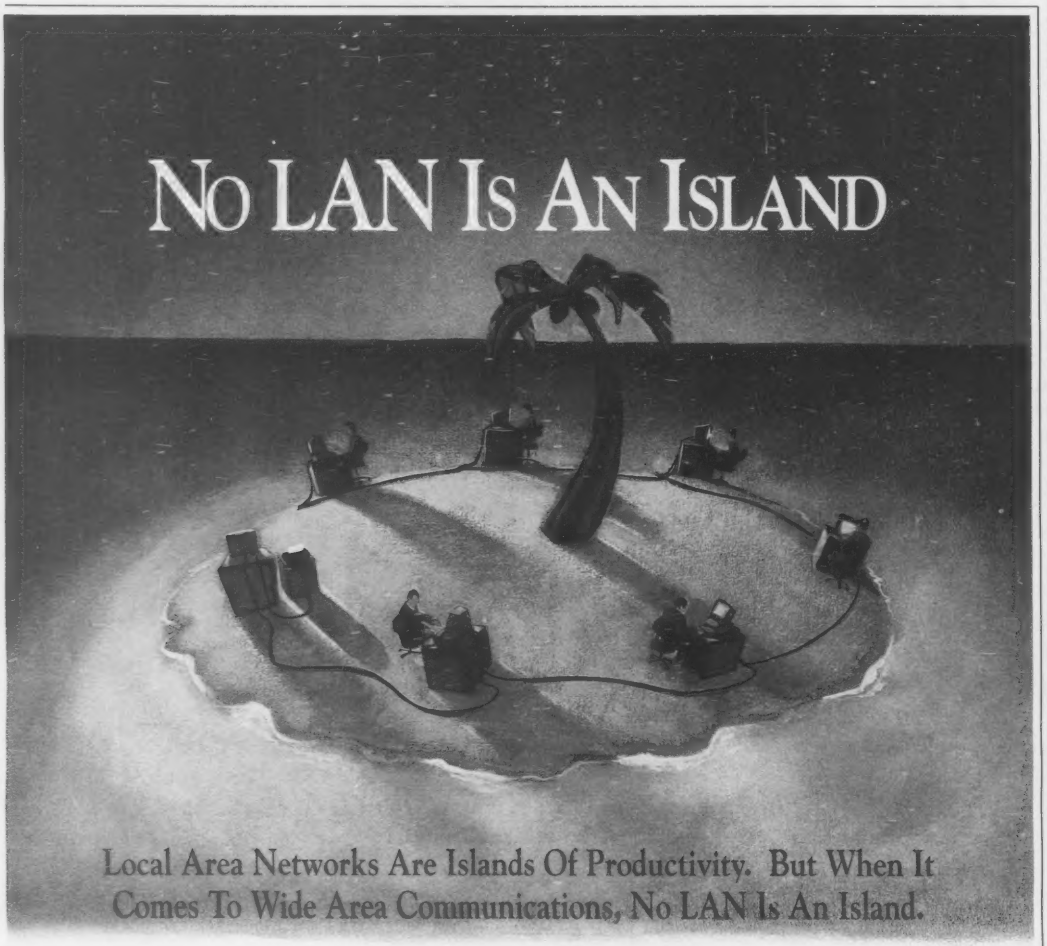
Sources speculated that the new line will offer a three-way processor, and all existing AS/400 models will be field-upgradable to the new generation. Currently, the top-of-the-line D80 provides dual-processing capabilities.

ADM, Inc., a Cheshire, Conn., consulting firm specializing in the midrange marketplace, said it expects IBM to officially roll out the E series systems sometime in the next 30 to 60 days, as a continuum of IBM's annual AS/400 series enhancements.

The D models, the last major revamp to the series, debuted last April.

IBM will also soon be offering Version 2 Release 1 of its AS/400 operating system, as well as introducing a Posix interface.

SALLY CUSACK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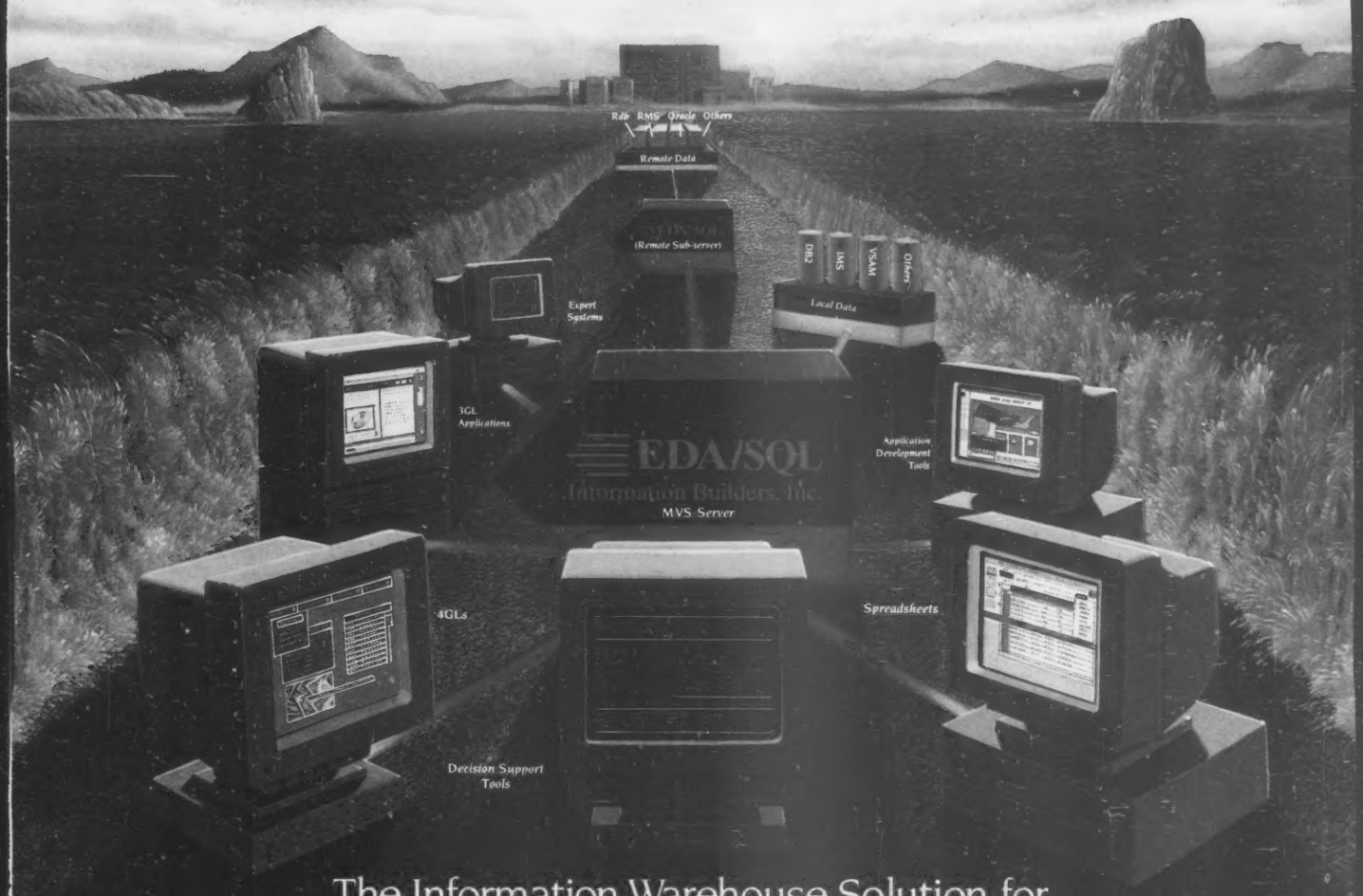

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HEWLETT PACKARD

Ernst & Young CASE quality service bows

BY KIM S. NASH
CW STAFF

NEW YORK — Ernst & Young unwrapped a service last week that targets experienced CASE users who want to straighten out organizational kinks in their software development projects.

Development Effectiveness is a seven-phase total quality management plan said to address problems in information systems groups that undermine support for new technologies, such as computer-aided software engineering (CASE), according to Vaughan Merlyn, head of Development Effectiveness.

"IS departments, compared with finance, distribution and other corporate functions, top the list when it comes to project failures," Merlyn said.

One common mistake IS groups make is funding software development on a per-project basis, without a holistic approach to how the company manages data, he said.

IS organizations usually hit a roadblock by taking a tools-only approach to CASE, with no regard for development methodology, Merlyn added. A shared vision for technology projects — and information handling — is crucial to keeping CASE going, he said.

Development Effectiveness, which costs anywhere from $50,000 to several million dollars, depending on the scope of the engagement, was designed to address those kinds of management problems.

Saving the CASE ship

The new service should be useful in a market where CASE is quickly sinking on the to-do lists of IS executives, according to Andrew Mahon, senior analyst at New Science Associates, Inc., a market research firm in Southport, Conn.

Ernst & Young's Merlyn *says key to Development Effectiveness is holistic approach*

"Putting a business context around the tools" will help keep CASE alive, he said.

Ernst & Young consultants lead IS and business-side managers through several surveys to assess the company's CASE readiness.

Merlyn said he has found that while many companies have piloted CASE projects, few have adopted CASE broadly as the primary application development approach.

"Making the transition from pilot to mission-critical programs gives rise to cultural problems users are unprepared for," and Development Effectiveness helps people recognize those stumbling blocks early on, Merlyn said.

So far, eight North American and European firms are using the method, but Ernst & Young declined to identify the customers other than to say most are in the financial services industry. One, Merlyn said, is a large-scale systems integrator.

Development Effectiveness is CASE methodology-independent, but some early adopters have been Ernst & Young Navigator series customers.

Two of the eight users are about to roll out major applications developed under the Development Effectiveness rubric, according to Richard Phelps, associate director at Ernst & Young.

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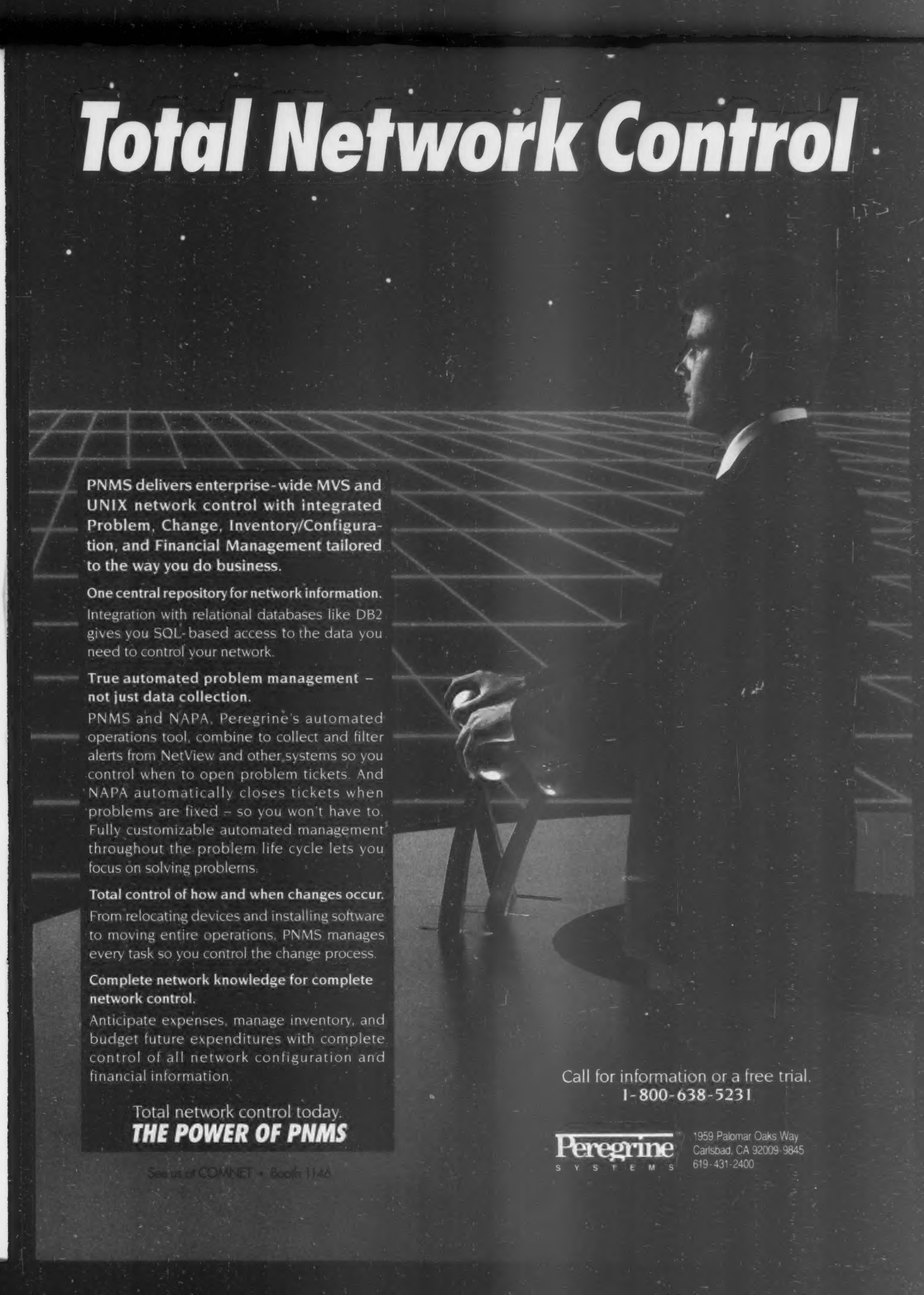

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TECH TALK

Brainy cars and roads

■ The National Research Council's Transportation Research Board has released a report proposing a program to research, test and implement "smart" highways and vehicles. There are four technologies involved, the report noted: advanced traffic management systems, traveler information systems, vehicle control systems and commercial vehicle operations. Smart highways and vehicles would allow for rapid response to road accidents, traffic-flow management and ramp metering on freeways, among other benefits.

No Mickey Mouse sound

■ Phoenix Technologies Ltd. has signed a pact with Walt Disney Computer Software, Inc. that will enable Phoenix to sell Disney's Sound Source technology to personal computer manufacturers. Sound Source technology provides OEMs with a cost-effective way to incorporate speech, music and sound effects in desktop and laptop computers, Phoenix said. The technology permits playback of sound files specifying Microsoft Corp.'s Multimedia Extensions for Windows, in addition to software designed to support Sound Source.

Artful lodger

■ IBM computer researchers have built a prototype computer system that could become the fine art repository of the future. It is a small computer system designed for storing, cataloging, displaying and reproducing color images of paintings and other graphic artworks, according to IBM. The protoytpe's images are good enough to be used to produce high-quality art books, the company said. The system consists of two IBM Personal System/2 Model 80 PCs, a scanner, a color monitor and an optical jukebox. The prototype has been installed at the Wyeth Collection's offices in Chadds Ford, Pa.

Recreating the human brain cell

Analog chip imitates 'sensory experience' in drive to replicate our irrational thought

BY CLINTON WILDER
CW STAFF

Computer scientists around the world are working to develop neural network software that mimics the human thought process more closely than digital computers do. But suppose there was neural hardware that programmed neuron-like processing directly onto computer chips?

Such technology is moving closer to reality at the California Institute of Technology in Pasadena. Caltech doctoral student Misha Mahowald, working with researcher Rodney J. Douglas at the University of Oxford in the UK, has developed a "silicon neuron" chip modeled on an organic brain cell.

Full-scale applications of the technology are years away, but they could include enhanced processing of sensory data, advanced artificial intelligence systems for decision support and robotics, among others.

Because the neural processes are embedded in silicon rather than software, orders-of-magnitude efficiency improvements over existing neural networks are possible.

Neural network programs are generally so large and complex that they require huge memory capacity and are a major processing challenge for even the most powerful computers available today.

Standard digital computing and integrated circuit logic is based on the assumption "that thought is a rational process," Mahowald said. "But it really isn't. You think in patterns that are based on your sensory experience. We are hoping that by starting from the sensory, we'll be able to learn the tricks that the nervous system is using."

Alan Levenson

Researcher Mahowald *is blending an academic background in biology with an interest in electronics to develop a silicon neuron chip*

While a digital computer may be an expert chess player, Mahowald pointed out, the same computer "can't play 'Go,'" which is a much simpler game to us. That's because thinking isn't always based on a logical, step-by-step process. It's based on something more sensory, more gestalt."

Neither Mahowald nor Douglas have traditional computer science backgrounds. Douglas is a physiologist, while Mahowald began as a biology major with a specific interest in the physics of nervous systems. She became interested in electronics by studying under Caltech Professor Carver Mead, whose development of a computer vision chip known as the "silicon retina" set the stage for the neuron chip (see story below).

The silicon neuron was designed as an analog chip because analog signals more closely resemble neural behavior than digital signals. "In a neuron, the membrane acts like a capacitor — the pores open and close based on the potential across the capacitor," Mahowald said.

On the neuron chip, each circuit represents a different kind of membrane channel. "Once we had the basic analog design, we just keep adding different kinds of inputs. It's very modular," Mahowald added.

She and Douglas did their first experiments at the University of Cape Town in South Africa, where Douglas was working. Since he moved to the UK, the two researchers have done most of their work together by electronic mail.

Their latest breakthrough is a prototype chip containing five silicon neurons. Initial production of the chip will take place at a fabrication facility funded by the U.S. Defense Advanced Research Projects Agency.

Mahowald said she is confident that neural chip technology will progress, but she never underestimates the complexity of the human or animal nervous systems that she and Douglas are trying to model.

So far, neurobiologists have praised the silicon neuron as behaving remarkably like real neurons. But Mahowald said she believes that neural chip design is just beginning to scratch the surface of this complex field.

"Remember, all we can really capture in silicon is a snapshot of a neuron, because the neuron is always changing — it's living and it's aging," she added. "No matter how much we do, [a chip] may never be that close to a real neuron. Then again, it might. We just don't know yet."

An electronic eye

When designing a computer chip to act like a human brain cell, figuring out what not to process is as important as what to process.

This type of electronic "filtering" was key to the silicon retina, a vision sensor chip developed by Caltech Professor Carver Mead. Many of the same principles used in the silicon retina are used in the silicon neuron developed by Mead's doctoral student, Misha Mahowald, and researcher Rodney J. Douglas.

Unlike most computer sensors, the silicon retina does not attempt to capture everything, but rather only what the human eye would see and process. It is "fooled" by the same kinds of optical illusions that deceive humans, for example.

That principle could have far-reaching implications for saving communications bandwidth in video transmission applications. Instead of moving all video data, which can be slow and expensive, a transmission based on the "sensory" principle might transmit only the images sensed to be critical.

"In any given TV image, only a small number of pixels in any given scene are important," Mahowald said.

The principle applies to sound as well. A traditional sensor will record all sound frequencies, though that is not the way the brain processes aural input. "When someone speaks, you don't hear all the exact frequencies," Mahowald said. "You hear the words and you know what they mean."

CLINTON WILDER

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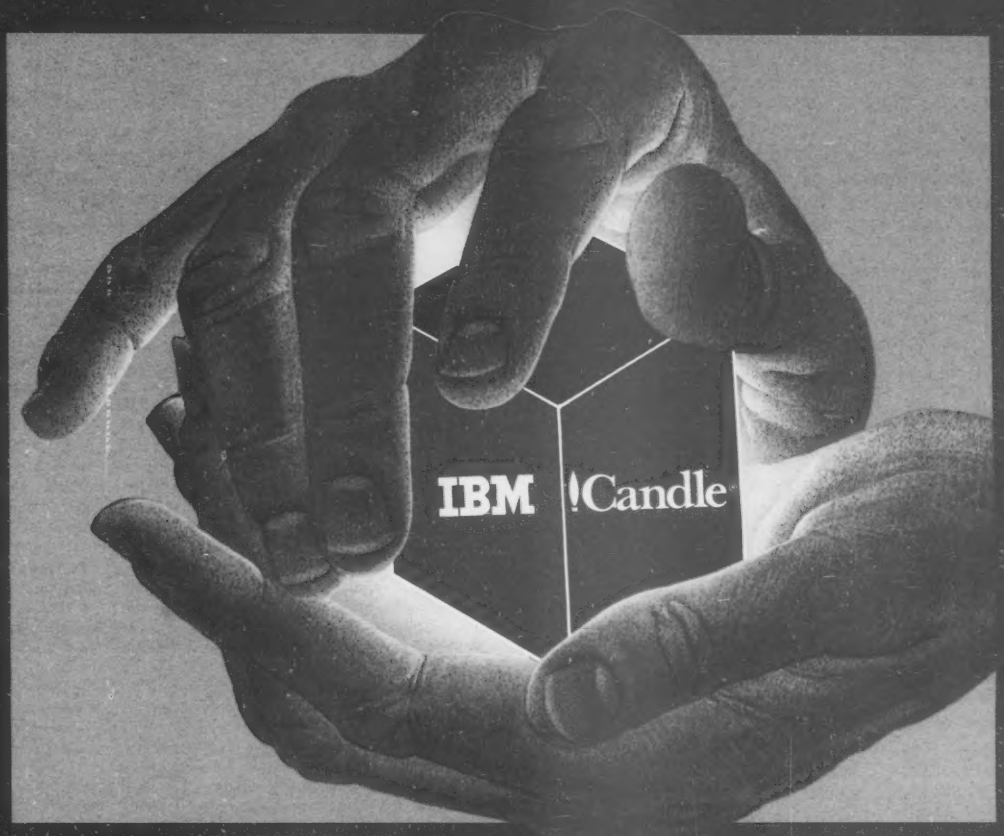

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EDITORIAL

Stupid Cupid

Birds do it. Bees do it. Even the flowers and the trees do it.

Yes, users are falling in love. With apologies to the late Cole Porter, who wrote the bars above, the object of their affections is client/server architecture. (All right, so maybe Cole had something else in mind, but this is the '90s, not the '30s.)

But there is one thing all love holds in common, no matter what the object of adoration. And that is its ability to confound and confuse the reality of certain situations; you know, love is blind and all that stuff.

In the current affair between user companies and client/server architecture — and a torrid affair it is — the offloading of applications from hosts to smaller and cheaper hardware platforms is often confused with the decentralization of IS. As is evident in most companies, that is really not the case at all.

Quite the contrary. The porting of host applications to server-hubbed networks of PCs and workstations requires an extraordinary coordination effort. The object of that effort is to move technology quickly into and throughout business units to facilitate local decision-making at the point of contact with the customer. But that does not mean that IS abrogates responsibility for evaluating, purchasing and implementing client/server technology to the business units. There's just no body of evidence that shows this to be the case in very many companies.

The problem is that non-IS executives in some corporate offices have seized on the client/server boom as a signal and a means to move control of the IS resource away from a central core. Over time, as central IS really does disband and move itself into the business units, this strategy becomes feasible.

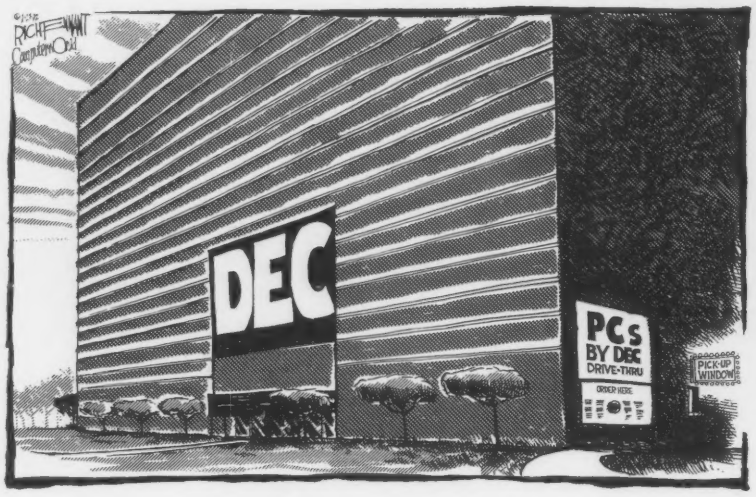
For the present, decentralizing the IS management function can undermine and even subvert the inexorable and very necessary downsizing movement. Forward-thinking companies are embracing client/server and the downsizing movement in general. But they are not neglecting the requirement of a high level of centralized orchestration of this movement at this early juncture of the "dehostification" of corporate IS.

Bill Laberis

Bill Laberis, *Editor in Chief*

.....

Editor's note: A "Fifth Wave" cartoon on page 2 of our Jan. 13 issue reinforced a negative stereotype of Native Americans. The cartoon was inappropriate and should not have been published. Both Computerworld *and cartoonist Rich Tennant regret any offense this may have caused our readers.*



LETTERS TO THE EDITOR

CA will retain lead

"Big Blue gaining in mainframe security" [CW, Jan. 6] cited a 1991 study conducted by Sentry Market Research (SMR) and used anecdotal evidence to form a hypothesis, while using SMR data to support it. SMR disagrees with some of the conclusions.

SMR's research supports the conclusion that Computer Associates International, Inc. is and will remain the leading vendor of data security software for IBM mainframe systems for the near-to-midterm future.

A misinterpretation could occur when you use SMR's purchase intention data to infer defections from ACF2 and Top Secret to RACF. While the writer showed some sites shifting from one vendor to another anecdotally, SMR's data does not show this to be a sizable trend.

Also, you contend that IBM is better suited to address the multiplatform, distributed security market. In SMR's opinion, CA is also well-suited to support a multivendor approach based on its support of multiplatform operating environments and platforms.

William A. Gannon Jr.
SMR
Westboro, Mass.

OOP slighted . . .

After reading Martin A. Goetz's article in Viewpoint [CW, Jan. 13], I did not know whether to laugh or become angry. Blanket statements that object-oriented programming (OOP) will not live up to its promise and will not fare any better than its predecessors are proof that Mr. Goetz is not adequately versed in OOP.

Mr. Goetz presented his list of alternatives to improve productivity — CASE tools, fourth-generation languages and code generators. These technologies have made an attempt over the years to change the face of IS capabilities, but they never offered the breakthrough improvements demanded by an increasingly competitive business environment.

These tools have been around for years, and yet the system backlog has not shrunk appreciably. Object-oriented technologies, however, are delivering that breakthrough promise.

We are now implementing a large and complex mission-critical application using an object-oriented system development tool called Sapiens. The only "rude awakening" we have had is that it far exceeds our initial optimistic expectations. We have seen an order of magnitude improvement in productivity and system development time over that of CASE tools.

All of the above real-world experiences are in direct opposition to Mr. Goetz's opinions.

David B. Johnson
Siemens Energy & Automation, Inc.
Alpharetta, Ga.

. . . and again

Your article, "Object orientation not cure for IS headaches" [CW, Jan. 13], demonstrated that you truly do not understand object-oriented programming (OOP).

The three points you identify as problems can be resolved by any novice object-oriented developer by applying the benefits of the OOP paradigm to the problems.

You are absolutely correct that object orientation requires a "massive analysis task," that "maintaining purity is hard" and that "objects require upkeep."

No company in its right mind would try to analyze all its systems in object-oriented terms immediately. The analysis task can therefore be localized to the objects that are necessary for a specific system.

Second, the need in an object-oriented environment to maintain object purity does not exist. A basic concept of OOP is that the testing of objects is localized to the objects that have been changed. An object that behaves properly for one application will behave properly for all applications that use the object's documented protocol.

Finally, your profound statement that "objects require upkeep" left me completely dumbfounded. Has anybody ever developed a software system that did not require maintenance? An object management group should be formed whose task it is to maintain and test these reusable objects. I guess this is a completely new concept for an industry in which large software systems have been routinely designed and developed by accountants, financial planners and managers for the last 10 years.

Bill Hyman
Charlotte, N.C.

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The death of personal privacy

CORINNE CHAVES

I am an information technology professional who, among other tasks, creates enterprise data models, designs databases and monitors technology for possible applications to my firm's businesses.

What I know about what can be and is being done with technology in terms of tabulation, compilation and storage of data involving the details of private lives has given rise to a growing personal concern about the future of privacy. If nothing else, I would like the creators of databases to think about the ethical considerations relevant to amassing large amounts of behavioral data about individuals.

The violation of personal privacy, which today is possible through the use of customer databases, ISDN source telephone number recognition, personnel files, insurance records and so on, is staggering.

Even if you pay cash, you cannot shop at some stores without giving your home phone number. From your number, the merchant can determine your name and address.

If you are a credit card user, your credit card vendor can compile a list of your favorite restaurants, the trips you have taken, the hotels you have stayed at and the gifts you purchased while traveling. The hotel companies' databases will know that you requested an iron, a makeup mirror and extra towels, that you ordered room service for two and that you had an 8 a.m. wake-up call.

If you call to make a catalog purchase and get a busy signal, the vendor may call you back. You don't even have to leave a message. The new ISDN source-routing tags source phone numbers and register them, so the company's phone switch can later retrieve and display them.

The telephone company also has a record of all your telephone calls, both local and long distance, which can then be used to create a profile of your communications habits.

David Uhas

All of that information is in the hands of total strangers. You, as an individual, have no way of knowing the level of integrity of the people handling your information. Moreover, the firms with which you do business have no way of knowing the level of integrity of their employees.

But they sure do know a lot about you. They know you buy gasoline once a week. They know you got a new car loan from Honda. They know your car note is $350 a month. They surmise you own an Accord. But you buy 20 gallons of gasoline a week! Where are you going when you do all that extra driving? After all, your job is local.

However, it's no one's business where you are, as long as you're not doing any harm.

As a private individual, my temptation is to become a hermit, pay exclusively on a cash basis, disconnect my telephone and only shop in stores that don't request my phone number or other identifying information.

Unfortunately (or fortunately), I don't really want to be a hermit. I like people and I like to interact with them, but there is virtually no way to do this without being put in a database somewhere.

As a professional, I feel strongly that we need to build provisions into the databases we create to flag those subscribers, customers and clients who choose not to be included in mailings, who choose not to have their names sold and so on. And, of course, we must give those individuals the opportunity to designate their preference. I hope that this will ultimately be a legal requirement.

In the interim, we can actively build in the security and take the measures required to safeguard one another's privacy.

Chaves is manager of decision support systems at The Promus Cos. in Memphis.

Bush in Japan: So why not chips, computers, software?

CHARLES P. LECHT

Cars, cars and more cars, as well as a bit of rice, seemed to be the primary issues under consideration during President Bush's recent trip to Japan.

Maybe this was because the president, accompanied by no less than 21 leaders of U.S. industry, had no one along more prestigious than the chairmen of Chrysler, General Motors and Ford. Maybe it was because these three were so hell-bent on getting Japanese people to buy U.S.-made cars and car parts and on getting Japanese industry to stop shipping so many of their own to the U.S.

But what I really found strange was the almost total absence of any discussion about computers, computer chips or software. Virtually no one mentioned computers. Have all the computer problems between the U.S. and Japan been solved? Has the famous chip pact been satisfied? Are Japanese people and companies buying more American-made chips and computers?

The simple answer to all those questions is "no," but these things are seldom simple.

Take the chip pact: The reason it has never been satisfied is that the chip problem the pact was meant to cure was never really there. The statistics we have been given over the past five years have been dubious at best. They excluded the chips made by America's biggest chip manufacturers for high-tech use on in-house products.

This caused chip manufacture and sales statistics to be biased against Japanese companies. This is the equivalent of calculating market share numbers in the automotive industry and leaving out car production by Chrysler, GM and Ford.

Japanese people are not buying American-made American computers for the good reason that they can't use them. These are systems that offer no Japanese character set, no Japanese-language documentation support and no local maintenance.

What they are buying, however, are foreign-made American computers such as those made by IBM Japan, which has the lion's share of the business systems computer market in Japan.

However, it's true that there has been a recent softening of interest in American-made supercomputers because companies such as Fujitsu, Hitachi and NEC have managed to create highly competitive supercomputer versions graced with complete Japanese-language support.

Indeed, the versions are so competitive that many other countries have decided to import them instead of U.S. offerings (despite the inherent difficulties their Japanese manufacture and documentation may offer).

But it should also be noted that, for two decades, our supercomputers were actively sought by Japanese government institutions and major corporations, despite their lack of Japanese-language support.

In the software arena, very little complaint by the U.S. trade group can and will be heard. Virtually all good-size Japanese computer systems are running U.S. software in the operating systems and utilities arena. These include such notables as DOS, Windows, OS/2, Lotus 1-2-3, Wordperfect, Wordstar, Dbase and Macintosh systems software — all of which have been converted to operate using the Japanese language.

U.S. companies receive royalties and other forms of remuneration for these products sold in Japan. I am unaware of any major Japanese-language software products that can run on American computers or any that have been converted to English for that purpose. There is some process control and communications software in the U.S. of Japanese origin, but you could hardly call it widespread.

So, despite the fact that the trade team has mentioned American software as one of the items they wish would help gain access to the Japanese marketpiace, they'll be hard-pressed to find any not already here.

It's no wonder the president offered his personal endorsement services to Toys R Us instead of IBM, Motorola, Texas Instruments and the other American microchip/computer contestants on the Japanese archipelago. He didn't have to.

Lecht is an IDG News Service foreign correspondent based in Tokyo.

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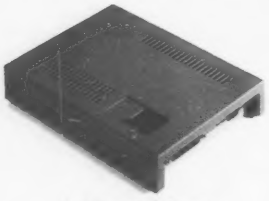

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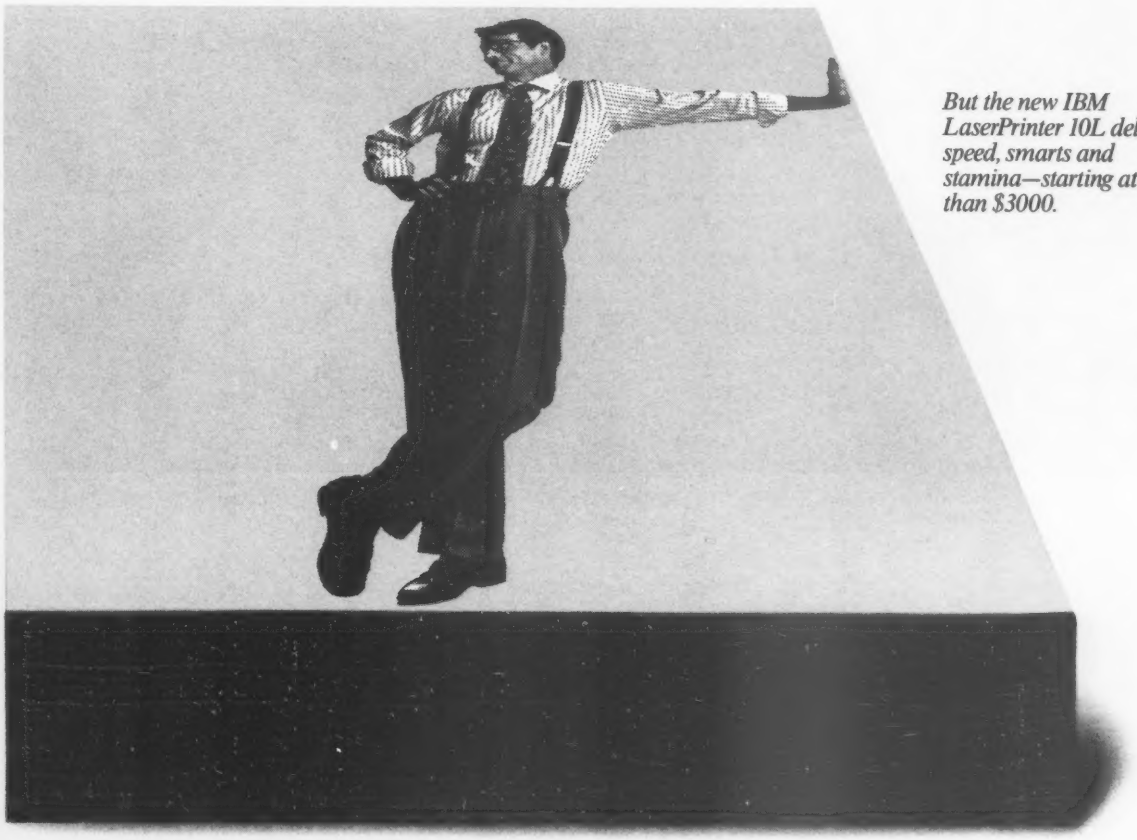

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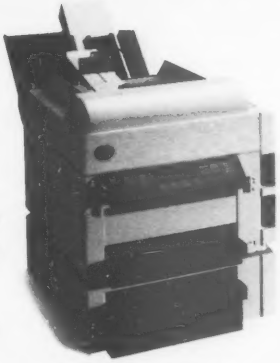

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Storage Tek eyes small tape library sites

BY JEAN S. BOZMAN
CW STAFF

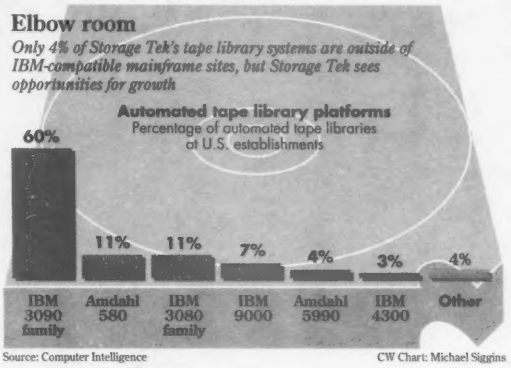
LOUISVILLE, Colo. — Storage Technology Corp., which already has more than 95% of the automated tape library (ATL) market, plans to break out of the glass house by 1994.

Having nearly saturated the market for tape libraries in large data centers, the $1.14 billion firm is eyeing smaller sites in order to boost sales of ATLs. During the next two years, it also plans to upgrade existing libraries owned by its 500 data center customers and to sell its new Iceberg redundant arrays of inexpensive disk drives as an alternative to IBM drives [CW, Jan. 20].

To widen its network for new customers, Storage Tek has already made the effort to port its ATLs to a wide variety of computer architectures, all of them host systems. These include Digital Equipment Corp.'s VAX, Cray Research, Inc.'s supercomputers, Unisys Corp.'s 1100/2200 series, Bull HN Information Systems, Inc.'s 9000, Siemens AG's 7590 and Fujitsu Ltd.'s M series.

Since ATLs can be used to retain official "images" of corporate databases, there is no reason why they cannot serve as the repository for all the critical data within an enterprise, even data from networks of personal computers and Unix workstations, analysts said.

It would not be impossible to imagine Storage Tek selling downsized ATL systems, according to Robert Callery, a senior storage analyst at Technology Investment Strategies Corp. in Framingham, Mass. "I think they have a long-term strategy to sell smaller libraries into the distributed environment, including PC LANs and Unix networks," he said.



However, that distributed data would most likely be routed to a host computer before storage in an ATL, analysts said. "Storage Tek's goal is to become the systems-managed storage [vendor] for the open environment," said Roxane Googin, a senior industry analyst at Gruntal & Co., a Los Angeles stock brokerage. "I don't see anybody else doing that."

Last October, Storage Tek's chief executive officer, Ryal Poppa, announced a new series of downsized libraries designed to attract new types of ATL customers. The current 4400 Automated Cartridge System library provides 1.2T bytes of storage capacity among 6,000 tape cartridges. The future ATL versions, identified by their Storage Tek code names, include Redwood, a 1994 device that would

Continued on page 32

D&B's direction focus of user concern

BY SALLY CUSACK
CW STAFF

FRAMINGHAM, Mass. — Dun & Bradstreet Software may have to step up its plans regarding product information and delivery of its mainframe accounting software in order to keep current customers satisfied.

A recent study of 100 IBM mainframe sites by International Data Corp. (IDC), a market research firm in Framingham, Mass., showed that while D&B Software customers were pleased with their vendor's support and service, company and product directions were an "area of concern" at IBM sites where D&B Software was identified as the primary accounting software supplier.

Looking for specifics

"It would be in [D&B Software's] best interest to be much more vocal and specific about product futures and directions," said Clare M. Gillan, director of the IDC study.

"At the last convention, D&B told us that they are not looking to improve what we have today. Instead of patching this and fixing that, they are looking to the future, which is client/server," said Les Palmer, co-chairman of Alliance Week, the national D&B Software user group conference.

Palmer, who is fixed asset accounting manager at Hallmark Cards, Inc., said he is confident the vendor will support its current products as long as there is a marketplace demand.

D&B Software has an installed base of more than 10,000 users worldwide on its E and M series mainframe accounting systems.

D&B Software announced its intention last year to migrate users over to a client/server-based strategy.

While the vendor has made alliances with companies such as Powersoft Corp. and Sybase, Inc. to provide graphical user interfaces and database strategies, to date, no prototypes of the products have been delivered or demonstrated for any user organization.

Not everyone is ready to jump to client/server, Gillan said, but users need to know what their supplier is doing.

'Superior' products

Classifying D&B Software's existing products as "superior," Michael Coxhead, vice president of MIS at JMB Retail Properties Co. in Chicago, said D&B Software is "not leading the pack" in the client/server arena.

JMB has been an M series site for more than eight years, and Coxhead said D&B Software's latest marketing literature for the mainframe product line has taken on a "cookie-cutter" quality: "It is OK and reasonable, but they are not showing us that they are differentiating themselves from any other mainframe software supplier."

Coxhead speculated that some of the flamboyancy may have been taken out of the vendor's message when John Landry, D&B Software's chief technologist, left suddenly last month to take a position at Lotus Development Corp. in Cambridge, Mass.

"They no longer have an articulate, eloquent speaker to present the client/server image to the public," Coxhead said.

Sources have speculated that a general ledger version of the client/server product will be rolled out by D&B Software sometime this quarter.

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Planning spells results at MCI

ON SITE

BY GARY H. ANTHES
CW STAFF

ARLINGTON, Va. — MCI Communications Corp.'s order-entry system for residential customers is as mission-critical as applications get, and when its transaction volume soared 70% in three months last year, MCI's technical staff had to scramble to keep response times within bounds.

The reason for the surge in activity: the success of MCI's new Friends & Family service, with which an MCI customer can designate up to 12 other MCI users in a "circle of callers" to get a 20% discount on long-distance calls. Overnight it became the company's most successful product rollout ever. Millions of circles were established, each associating multiple customers with an account in the database.

Computer capacity planning and performance management are critical activities at MCI, where double-digit annual growth is the norm and computing does not just support the business — it is the business. In a recent report criticizing federal agencies for doing a poor job of capacity planning, the U.S. General Accounting Office cited MCI as an organization with a successful capacity management program (see story below).

MCI has 21 specialists devoted to capacity planning and performance management, with seven doing capacity planning, nine engaged in consulting and software engineering for performance optimization and five devoted to monitoring and tuning production systems.

Perpetual planning

A key element in MCI's approach to planning is to do a lot of it, said James L. Zucco, senior vice president for systems engineering. Five-year plans are updated annually, annual plans are revised quarterly, and quarterly plans may change biweekly, he said. Practice makes perfect, apparently — Zucco said MCI's capacity planning staff has such a good track record that top management will accept, with little question, a recommendation to spend millions on a system.

However, MCI does not avoid bottlenecks by laying in a lot of excess capacity. The company's 13 IBM mainframes run nearly flat out, according to Lee Scalzott, director of systems engineering.

The planning process takes input from three major sources. Sales projections translate readily into business measures such as numbers of new customers, call volumes, customer bills and the like. Those go into a computer model developed by MCI, as do service-level objectives such as response time. Out of the model flows capacity requirements for each of MCI's five data centers, indicating the need for hardware resources such as off-line and on-line storage, main memory and processor power.

Capacity planners also factor in advance notice of new software coming from MCI's applications developers and forecasts of new technology from industry research firms and vendors.

Passive planning often gives way to a proactive performance management role, Zucco said. New applications are stress-tested using IBM's Teleprocessing Network Simulator, and software found to be a resource hog faces additional work before being put into production.

Once applications are in production, MCI uses a variety of automated tools to spot abnormal patterns, looming bottlenecks and other trouble spots. When they are found, the consulting group works with users and software developers to tune applications or to smooth work loads. "They are the conscience of the organization," Zucco said.

He estimated that without this proactive approach, MCI would have 50% more computer capacity. "We don't just draw a straight line [to do capacity planning]," he said.

MCI uses more than a dozen software products from IBM and third-party vendors for capacity planning and performance monitoring. But Zucco said the tools produce a flood of information. The trick is knowing what statistics to look at and what conclusions to draw from them, he said.

Surprising success

Zucco said capacity planning for a new service begins as soon as the service is "a glint in marketing's eye." Even so, the surge in system activity that accompanied the introduction of Friends & Family was more than anyone had predicted. The short-term solution was to tune the application, Zucco said. Meanwhile, MCI upgraded its mainframes and added another machine. "We also shed some lower-priority applications," Zucco acknowledged.

Grand plan

MCI has the following:

- Five data centers.
- 10 IBM ES/3090 Model 600Js and three IBM ES/9000 Model 900 mainframes that processed 12 billion telephone calls in 1991.
- 8T bytes of on-line storage.

MCI uses capacity and performance tools such as:

- Legent's MICS products for capacity planning and performance monitoring.
- IBM's Teleprocessing Network Simulator, a transaction generator for 'stress testing' CICS applications.
- SAS Institute's SAS for analysis and reporting.
- BGS Systems' Crystal Performance Evaluator for predicting performance and capacity requirements.
- Legent's TSO/MON for analysis of TSO performance.
- Candle's Omegamon for performance monitoring.

CW Chart: Janell Genovese

MCI as role model

The GAO recently cited MCI as an example of a firm that does a good job of computer capacity management. The audit agency was less kind in its assessment of the Federal Aviation Administration (FAA) and the National Institutes of Health (NIH).

Two of the six IBM mainframes the NIH has leased since 1988 were "unnecessary," costing taxpayers $16 million, the GAO said. In an analysis of five of the NIH's six 3090-200 computers, the GAO found that usage averaged 45% of capacity. The reason, according to the GAO: "Computer center managers . . . [did] not monitor equipment utilization or perform modeling as part of their capacity management program."

In a separate report, the GAO said the FAA has not implemented effective computer capacity management practices for its automated systems. Despite spending $3 billion annually on information technology, the agency lacks adequate policies, procedures and tools for capacity management, the GAO said.

Intergraph gives boost to Clipper performance

BY MARYFRAN JOHNSON
CW STAFF

HUNTSVILLE, Ala. — Intergraph Corp. shored up its wobbling position in the computer-aided design, manufacturing and engineering (CAD/CAM/CAE) market recently with a family of servers and workstations said to deliver three to six times the performance of the current Clipper line.

"I think they're off the hook," said Charles Foundyller, president of Daratech, Inc. in Cambridge, Mass. "They were up against the wall. They absolutely had to do this."

With a claim on nearly 16% of the $7.3 billion CAD/CAM/CAE market in 1991, Intergraph's line of Clipper workstations had slipped dramatically behind in performance compared with its toughest rivals: IBM, Computervision, Inc. and Hewlett-Packard Co.

The appearance of the new Clippers — available in March — will boost Intergraph's line "to the top 20% of the workstations out there in this particular category," said Ken Anderson, publisher of "The Anderson Report's Technical Guide to Unix Engineering Workstations." "Intergraph really focuses on responding to their customers, which are primarily CAD users."

Based on RISC chip

The new machines are based on Intergraph's C400 reduced instruction set computing (RISC) processor. This second-generation chip incorporates superscalar and superpipeline architecture, and it features a separate floating-point unit.

The Series 2400 desktop and Series 6400 deskside workstations and servers offer 33 Specmarks of performance. Company officials said they plan to scale the C400 chip up to its maximum 100 Specmark potential within the next year or two.

The Interpro, Interact and Interview workstations range in price from $18,500 to more than $100,000. "At first blush, they look pricey, but that's only because the Intergraph workstations come complete in usable color configurations," Foundyller noted. The Interpro 6450 3-D workstation, for example, costs $24,900 while a similarly configured IBM Powerstation 520 would cost $31,812.

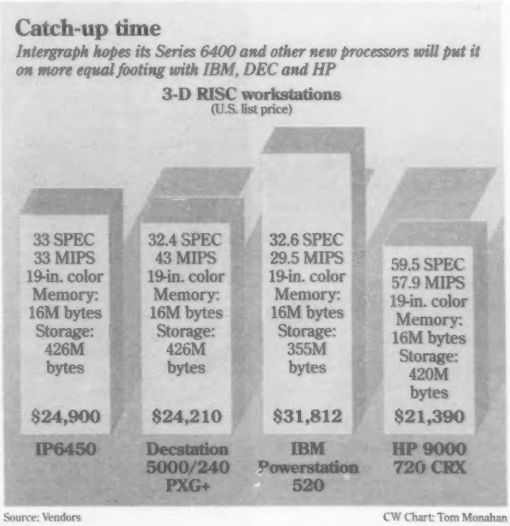
At James M. Montgomery Consulting Engineers, Inc. in Salt Lake City, a dozen new Intergraph systems are already on their way, said Kelly Stevens, supervising engineer in the CAD department. The engineering firm, with more than 30 offices worldwide, has about 100 Intergraph workstations and servers.

"They've really needed to get the performance level of these machines back up to par with the industry, and there is a lot of room for growth in this C400 architecture," Stevens said.

He added that his firm never considered abandoning the Intergraph platform for higher performance competitors. "It's not just the price/performance that matters to us," Stevens noted. "It's also the integrated software with the platform, and Intergraph is far above the other vendors there."

Catch-up time

Intergraph hopes its Series 6400 and other new processors will put it on more equal footing with IBM, DEC and HP



Source: Vendors

CW Chart: Tom Monahan

TI's Unix CASE plan targets commercial users

BY KIM S. NASH
CW STAFF

Texas Instruments, Inc. last week joined rivals in the integrated-CASE market by announcing plans to port its application development workbench to Unix-based hardware. But so far, integrated computer-aided software engineering (I-CASE) tools for building business — not scientific — software on Unix may be seen as products in search of a market.

In recent joint announcements with Hewlett-Packard Co. and with IBM at Uniforum last week, TI gave more specifics than other commercial I-CASE firms about its Unix plans.

TI said it will start reselling IBM's RISC System/6000 workstations this year, bundled with TI's Information Engineering Facility (IEF).

The HP deal calls for IEF for the HP 9000 to roll out in several phases, starting with an implementation tool set in 1992's first quarter. It will control compiling and linking of programs generated by TI's MVS- and OS/2-based construction tools.

By promising products for Unix, mainstream commercial CASE vendors are making a play for users who are downsizing mainframe programs to open platforms. But users do not care much right now, said Ed Acly, director of software strategies at Technology Investment Strategies Corp., a market research firm in Framingham, Mass.

In the commercial world, "people are busy worrying about moving to Unix boxes, [and are] not interested in doing all-out development for them yet," Acly said. He noted the dichotomy in Unix development: business applications vs. "techie" real-time Unix engineering. I-CASE vendors are shooting for the first sect, while smaller firms cater to the scientific set, he said.

Tools such as the C Development Environment from Integrated Development Environments, Inc. (IDE) and Teamwork from Cadre Technologies, Inc. are targeted more toward scientific than business users, Acly said.

However, IDE is trying to change that perception through a deal with IBM to integrate one of its products, Software Through Pictures, with IBM's new AIX Software Development Environment Workbench/6000.

Storage Tek extends focus

CONTINUED FROM PAGE 29

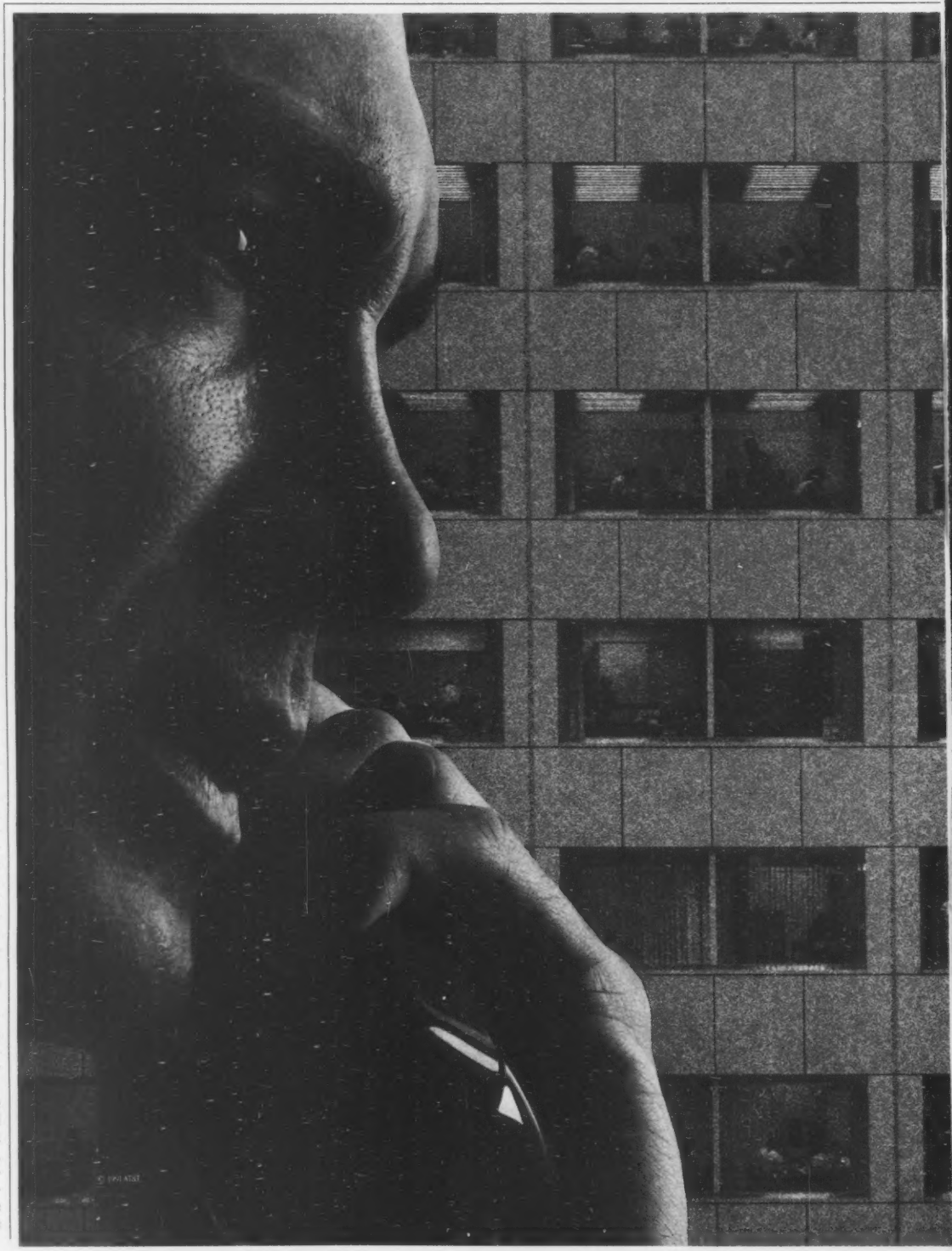
store 100 times more data than current 200M byte cartridges; Powderhorn, a 1993 field upgrade from the first generation of ATLs; Timberwolf, a 1993 low-cost ATL with only 500 to 1,000 cartridges; and Timberline, a 1993 cartridge subsystem with 36 tracks — double the current number.

"Selling the next 3,700 tape libraries will be far more difficult than selling the first 3,700," Callery noted.

So far, Storage Tek has staved off IBM by picking an area in which IBM had no product offering and marketing it aggressively to IBM's mainframe users. IBM was stung by each Storage Tek library displacing dozens of IBM 3480 tape cartridge drives. There have been signs that IBM's Storage Products Division in San Jose, Calif., may respond by marketing its own tape library, analysts said.

Industry analysts said they believe that Storage Tek wants to grow by identifying more storage product niches untouched by IBM.

"First, they went after the really large data centers," said Karen Landis, a senior analyst at Computer Intelligence/Infocorp, which tracks Storage Tek's installed base. "Now, they're really going after machines like the AS/400, which may not even be in the central data center."



Retailers seek high-tech profit boost

IS pros at retailer's convention see technology as crucial to real growth

BY SALLY CUSACK
CW STAFF

NEW YORK — Information technology can play an important role for retailers as their companies seek to improve customer service, enhance store performance and lower operating costs during these difficult economic times.

Information systems professionals throughout the U.S. gathered here earlier this month to share information at the annual National Retail Federation convention.

According to Carl Steidtmann, chief economist and vice president of Management Horizons, a division of Price Waterhouse, the combination of low inflation and stagnant real growth means margins will shrink. Profits will come only to those retailers that can grow inventory, space and labor productivity, Steidtmann said.

Large retailers agreed with the prognosis, and many are looking for high-tech solutions to these problems (see story page 77).

"It is our vision to develop and customize our systems to provide a competitive weapon via technology," said Charles Braddy, vice president of MIS at Victoria's Secret. The lingerie manufacturer uses Digital Equipment Corp. VAX/VMS systems and plans to draw from the "best thinking of all our people across all departments in developing a centralized integrated approach to designing systems," Braddy said.

Another vice president of IS in the apparel industry said she was shopping at the conference for a systems solution to replace her company's aging proprietary mainframe platform. Hardware and software vendors were on hand to demonstrate and display everything from point-of-sale (POS) to security systems.

Among them, Fujitsu Systems of America and Hewlett-Packard Co. announced a joint agreement to provide store-level, Unix-based POS systems. Under the alliance, Fujitsu will integrate HP's 9000 Series 800 in-store processer with the Fujitsu POS products. This open systems approach lets retailers install a customized in-store system capable of integrating a host via either Fujitsu or HP networks.

HP's Openstore reduced instruction set computing (RISC)-based environment is currently being used by Wal-Mart Stores, Inc., The Home Depot, Inc. and Strawbridge & Clothier.

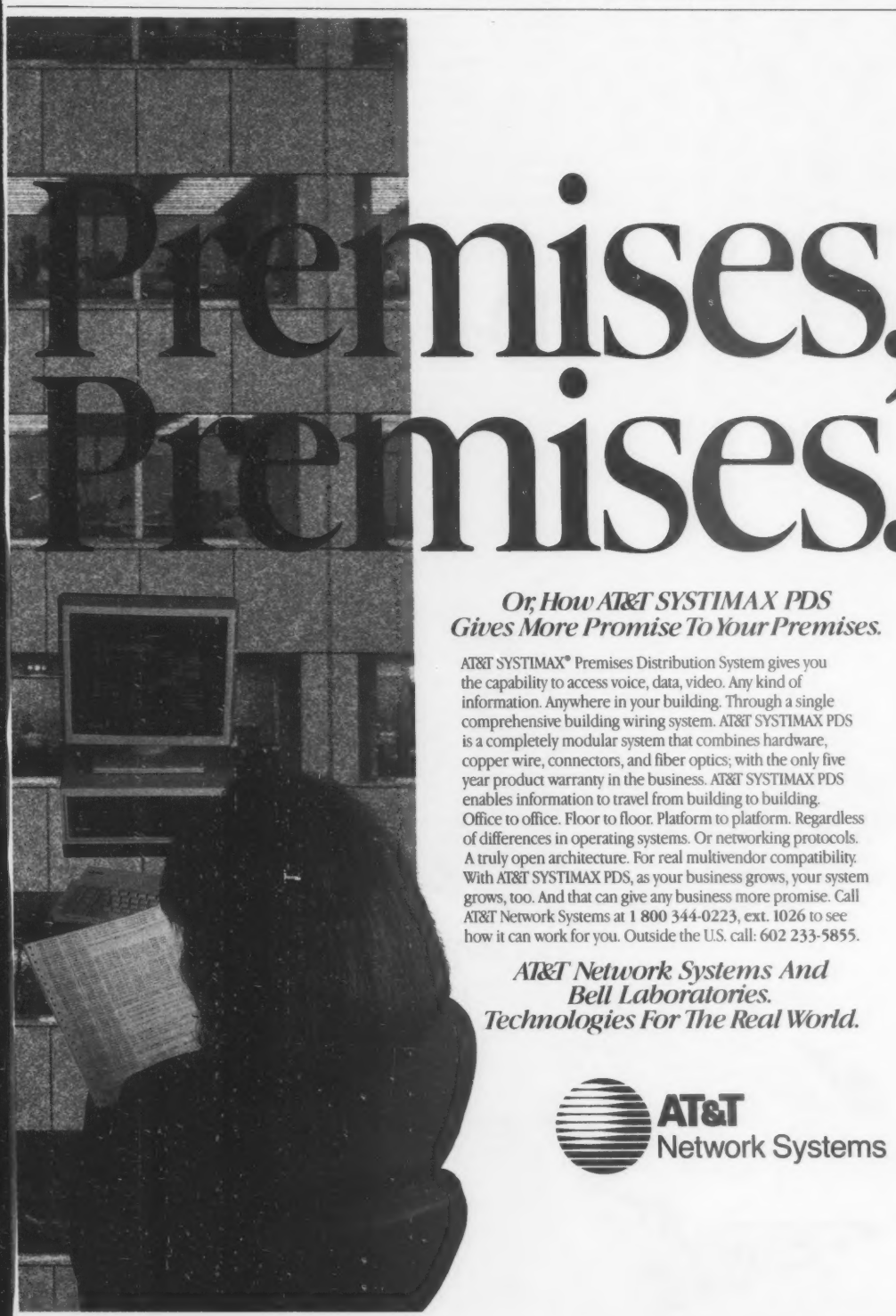
Thomas Rittenhouse, vice president and controller at Strawbridge & Clothier, said the company decided about a year ago to standardize on open systems platforms. They are replacing older IBM Series/1 computers with HP Unix-based servers.

Additional news

Other introductions at the show included the following:

- Symbol Technologies, Inc., based in Bohemia, N.Y., unveiled a prototype for a portable POS device for wireless, mobile transactions throughout the retail store. The portable POS device is anticipated for delivery in the third quarter.
- Checkpoint Systems, Inc. in Thorofare, N.J., introduced a personal computer system with remote dial-in capabilities. The system is designed to prevent both internal and external shrinkage of retail goods.
- STS Systems, a Montreal retail software provider, demonstrated a prototype executive information system running on Intel Corp. 80386-based Microsoft Corp. Windows environments. The customizable system is geared to nonexpert, nontechnical end users and will allow executives and departmental managers to access and manipulate financial, inventory and other data from a variety of sources.

The software program will be available later this year.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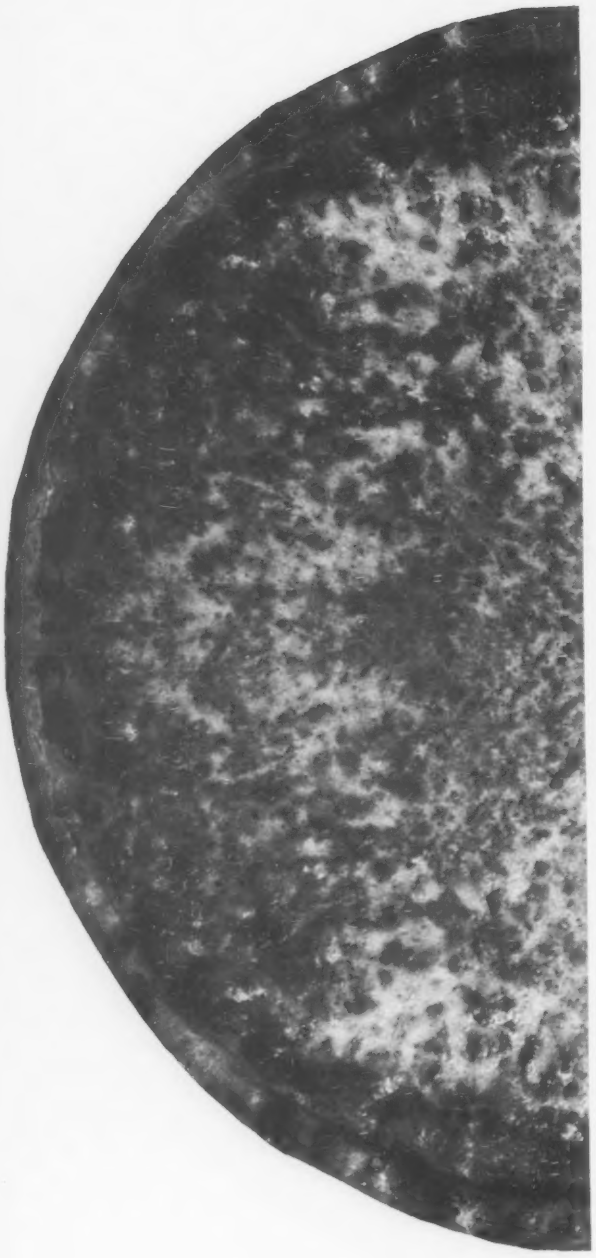

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Users eye new functions in Sequent systems

BY JEAN S. BOZMAN
CW STAFF

BEAVERTON, Ore. — Sequent Computer Systems, Inc., trying to push aside the news of its 20% work-force cut late last year, last week upgraded its flagship line of Symmetry computers with processors based on the 50-MHz Intel Corp. I486 chip. The enhanced computers are intended to serve two purposes for Unix shops: to be host computers for large personal computer local-area networks and to be warehouses for relational database management systems.

The new Symmetry 2000 series Models 250, 450 and 750 — shipped to a small group of customers in December and January — are being made generally available this month. There can be a maximum of six 486 processors in the Model 250, up to 10 processors in the 450 and up to 30 processors in the 750. Prices for the new models range from $50,000 for an entry-level Model 250 to $2.5 million for a high-end Model 750.

At the same time, Sequent boosted I/O rates by announcing a special four-channel disk-drive controller that supports four separate 10M byte/sec. channels. Using eight such controllers on the Model 750, users can address 260G bytes of storage memory, Sequent said.

One early user, Averitt Express, Inc. in Cookville, Tenn., plans to have one Model 750 act as a dedicated database server and another host PC applications for the trucking firm's 50 branch offices.

"This is our first open systems purchase," said Dave Ballance, director of computer resources at Averitt. "It will ultimately replace an older Prime system that we have had for many years." The firm plans to run the new Sequent machines in parallel with the Prime Computer, Inc. computers for many months while applications are converted to Unix, he said.

The four-channel controller will allow continuous processing, even if one disk drive fails, — a feature that could prove important to large commercial sites. "A disk replacement is probably the No. 1 item that would cause you to interrupt processing," noted Mark Chandler, a software designer at Asix, Inc. who worked on a Sequent Model 700 for the Seattle municipal courts system. "Now, you can pull out some of the disk drives while the machine is running."

Some industry analysts view Sequent's processor upgrade as a way to differentiate its products from those of other Unix platform vendors. "The success of Sequent and of Pyramid has attracted the attention of Unix mini vendors who want to move upscale," said William Bluestein, a senior analyst at Forrester Research, Inc. in Cambridge, Mass.

To anchor massive PC LANs better, Bluestein said, Sequent last year adapted Novell, Inc.'s Netware for use on its multiple Intel processors.

NEW PRODUCTS

Unix software

Magic Software Enterprises, Inc. has ported its Magic line of applications development tools to the Unix operating system. The software tools provide a menu- and table-driven environment for developing programs without writing code. The Unix version is compatible with the DOS version, allowing personal computer applications to be ported transparently to Unix systems.

Runtime prices start at $1,500.

Magic Software Enterprises
1200 Main St.
Irvine, Calif. 92714
(714) 250-1718

Development tools

Britz Publishing, Inc. has released Unidex, an indexing system for midrange computers.

Unidex creates programs for on-line data file searches. It asks the user for a description of each file along with search keys and fields to be displayed. The software then generates and compiles search programs in RPG-II source code. No programming is required on the part of the user, the company said.

A permanent license costs $99.

Britz Publishing
Suite 1A
986 Madison Ave.
Madison, Miss. 39110
(601) 853-1394

Applications packages

Halberstadt & Co. recently announced availability of Release 3.0 of its Equipment Manager System/400 vehicle maintenance management software.

The software runs on IBM Application System/400s and allows users to track equipment repair history, along with parts inventory, maintenance scheduling and worker productivity.

It costs $10,000 to $20,000, depending on the AS/400 model.

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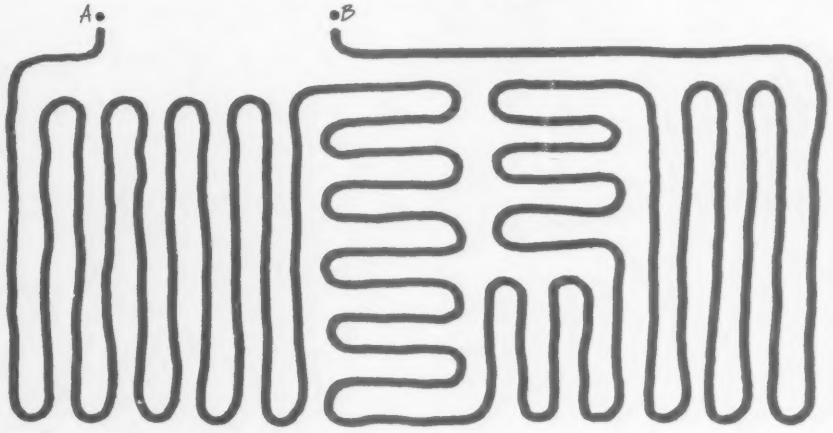

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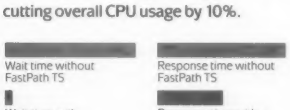
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Worldwide Consulting

Client/Server: Direction of the '90s
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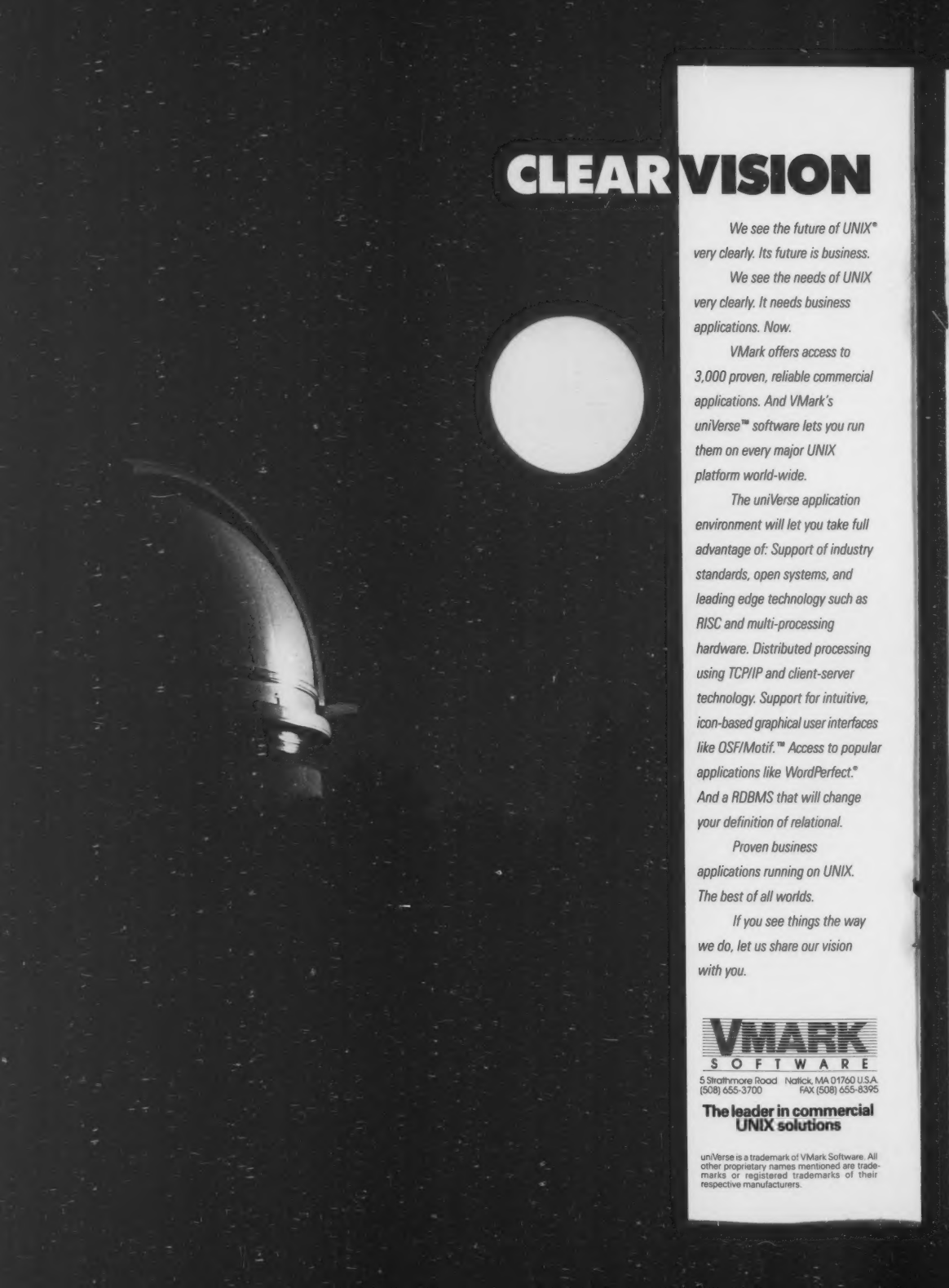
uniVerse: DELIVERING A MATURE Unix APPLICATION ENVIRONMENT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Introduction

Unix, in its many guises and ever-changing forms, is a complex technology for even the most skilled Information Systems (IS) department. At a time when IS budgets and payrolls are shrinking, mastering Unix becomes even more difficult. And just as there is no denying the complexity of Unix, there is also no denying its staying power.

One way to harness that power while taking advantage of existing systems is to implement uniVerse, a native Unix application development environment which enables software developed in the Pick environment to work on any Unix system. uniVerse users can use their existing software or choose from a suite of 4,000 other mature applications.

uniVerse also offers a conducive environment for developing new Unix-based applications. It includes a three-dimensional database file structure, data dictionary and query language. In its native Unix environment, it allows developers to take advantage of Unix features, including the full range of software tools, communication options and front-end technologies.

Despite its strengths, uniVerse still faces some obstacles. Like Pick, it suffers from a lack of name recognition. It also needs to reach new markets. VMark Software, Inc., which produces uniVerse, must continue its largely successful efforts to market to VARs and systems integrators while stimulating applications development from new sources.

Succeeding in an open systems IS environment is another challenge for VMark. So far it has implemented in uniVerse such standards as Posix, Motif, X and TCP/IP. In order to fully enable connectivity with other heterogeneous databases, the company is actively implementing appropriate standards specified by the SQL Access Group.

uniVerse is currently at a crossroads. VMark expects continued growth in its traditional business and if uniVerse is thoughtfully developed to meet a wider range of user needs, it will be a productive partner of Unix for the long term.

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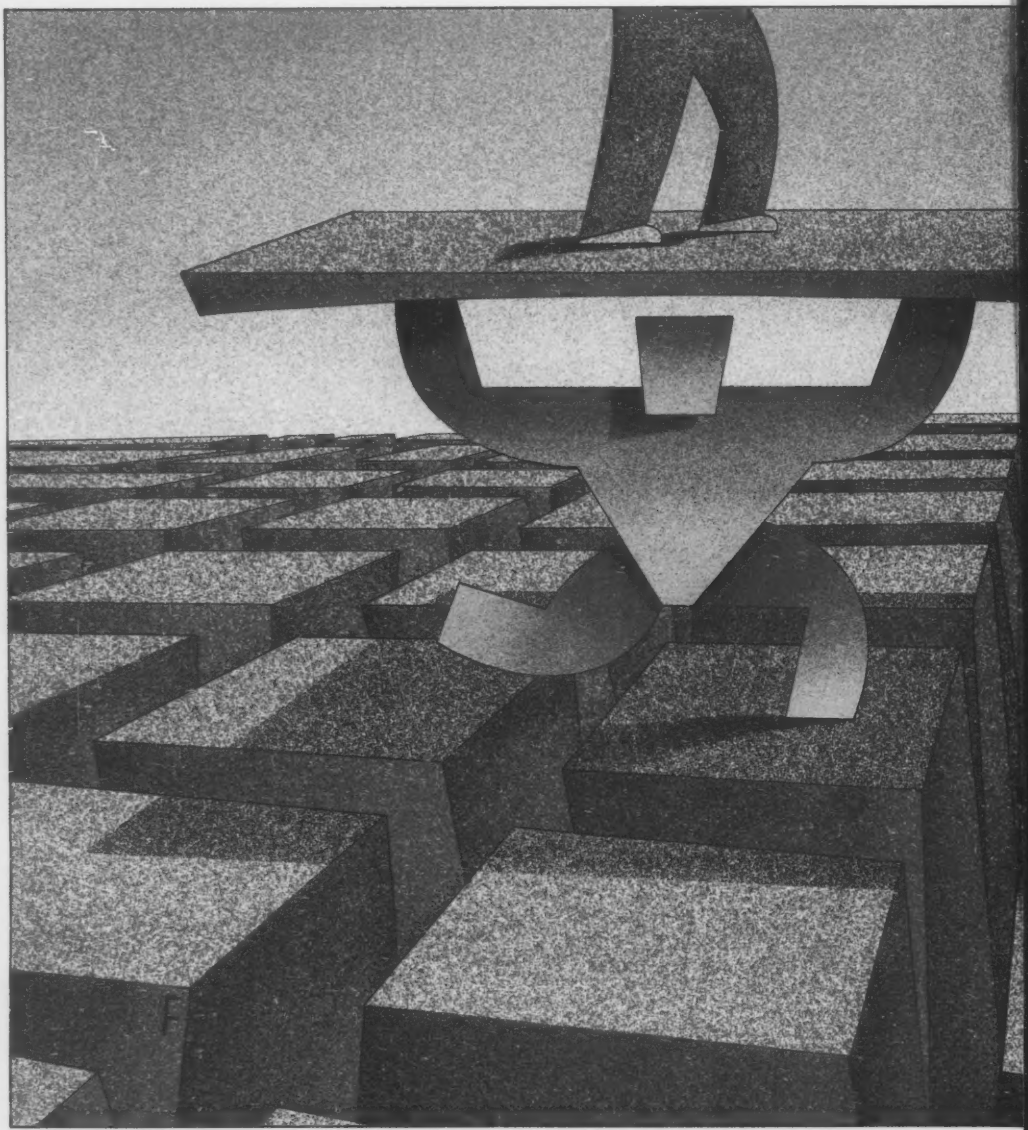
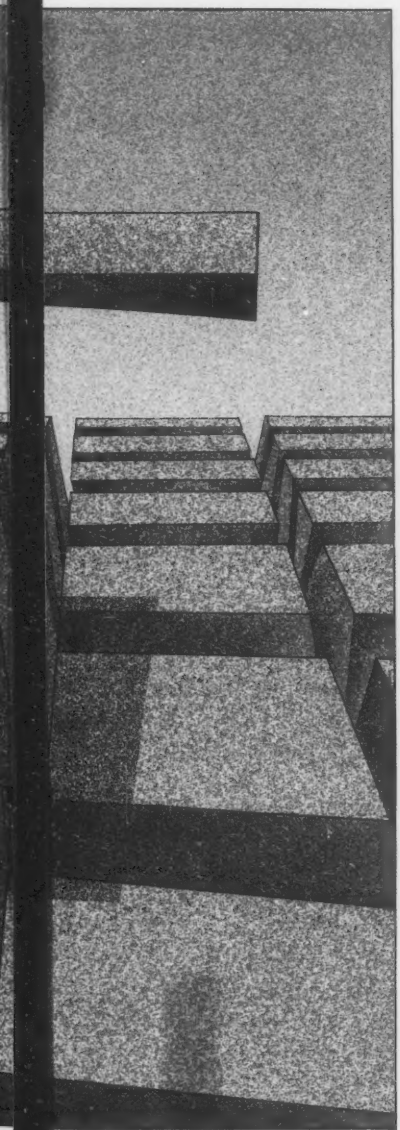




uniVerse: DELIVERING A MATURE Unix APPLICATIONS ENVIRONMENT

THE RESULTS OF A RECENT INTERNATIONAL DATA CORP. (IDC) SURVEY OF 249 MULTI-USER COMPUTER SYSTEM SITES REVEALS THAT 80 PERCENT OF THOSE SITES WILL ACQUIRE ONE OR MORE ADDITIONAL MULTI-USER SYSTEMS WITHIN THE NEXT THREE YEARS. FURTHERMORE, 59 PERCENT INDICATE THEY WILL BE OFFLOADING APPLICATIONS FROM THEIR CURRENT SYSTEMS TO THESE NEW MULTI-USER SYSTEMS.* ■ NOT SURPRISINGLY, Unix IS IN A POSITION TO FLOURISH IN THIS DYNAMIC COMPUTING ENVIRONMENT. ALMOST HALF (46 PERCENT) OF THE SITES SURVEYED BY IDC SAY THEY ARE CONSIDERING Unix TO SOME DEGREE. USERS WHO WISH TO REALIZE THE BENEFITS OF Unix SYSTEMS AND A MATURE SUITE OF APPLICATIONS MAY DO WELL IN CONSIDERING uniVerse, A NATIVE IMPLEMENTATION OF THE PICK ENVIRONMENT IN Unix. ■ THE PICK ENVIRONMENT HAS BEEN REGARDED BY A KNOWLEDGEABLE FEW FOR OVER 20 YEARS AS AN EFFICIENT PLATFORM FOR DEVELOPING AND DEPLOYING APPLICATIONS THAT

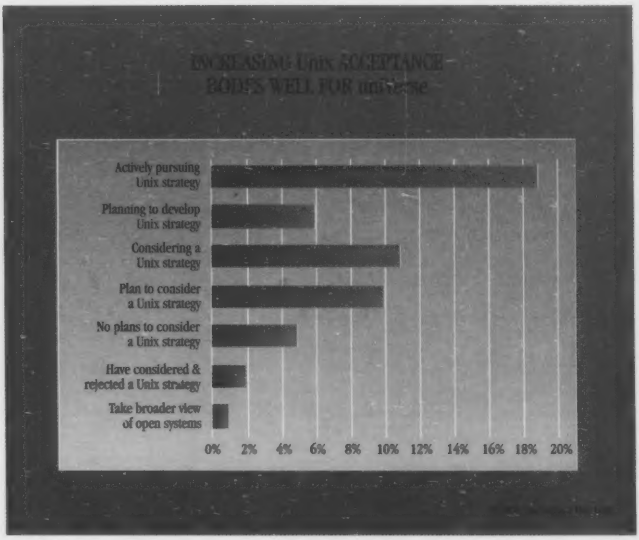
* TWO HUNDRED OF THE 249 SITES INDICATE THEY WILL BE EITHER ACQUIRING NEW MULTI-USER SYSTEMS OR OFFLOADING APPLICATIONS AND/OR ACTIVITIES TO NEW MULTI-USER SYSTEMS. THE 200 SITES CONSISTED OF TWO GROUPS OF 50 SITES CONSISTING OF IBM 3080/3090 AND DEC VAX 6000/8000 SENIOR SYSTEMS, AND FOUR GROUPS OF 25 SITES WITH WANG, UNISYS, PRIME AND DATA GENERAL SYSTEMS.

unfortunately ran on its own proprietary operating system. In following the growing acceptance of Unix in the commercial marketplace, VMark Software, Inc., of Natick, Mass., has taken Pick's application development and delivery environment and implemented it in Unix in the form of uniVerse.

Thus uniVerse is the product of merging the strengths of Pick — an integrated database/file manager, a data dictionary and a query language — with those of Unix, which has multi-vendor support across multiple platforms.

Why implement a native Unix version of Pick? Because Pick, like Unix, was developed over 20 years ago, and offers a mature environment with many available applications. Via its compatibility with Pick, uniVerse has access to over 4,000 applications developed exclusively for that environment. This allows VMark to focus its energies on offering the best possible product, an application design, development and delivery environment (AD^3E), while other vendors with operating systems' expertise deliver the Unix operating system component.

What are the components that make up uniVerse and why is uniVerse a good AD^3E? The major components of uniVerse include the following Pick-compatible elements: database; file manager; query language; command language; processor (i.e., shell); BASIC compiler and run-time environment, and distributed database support.



Almost half (46%) of sites surveyed by IDC indicate an interest in acquiring Unix. Many of these sites are potential uniVerse users.

DATABASE AND FILE MANAGER

While VMark has implemented the Pick Application Programming Interface (API) for uniVerse, the database and file manager system is the cornerstone of uniVerse. The benefits of doing a complete emulation of the Pick file system on Unix are twofold. First, as far as the application and the developer are concerned, the file system has not changed. System data is still accessed in the same way. Second, because the files created by uniVerse are normal Unix files, standard utilities may access them, and special disk partitions do not have to be created. Unix commands such as CP (copy), MV (move/rename), and TAR (tape archive) all work on uniVerse files. In addition, third-party backup and system administration utilities all work on uniVerse files.

In a business environment, the size of the data sets may be constantly changing. uniVerse allows for the space allocation of files to be dynamically modified without system operator intervention. High- and low-water triggers may be created so that file size is changed automatically when the number of records reaches either of the triggers.

The uniVerse database management system relies heavily on data dictionaries. A data dictionary is a file that is defined and created by the application developer, and stores "metadata". Metadata may be best thought of as data describing the data. Because the data elements within uniVerse are typeless, the data dictionary contains information on how specific functions operate on the class of data in question.

RETRIEVE, a standard part of uniVerse, is its database manager and report writer/query language. RETRIEVE has both English-like semantics and syntax. The main structure behind RETRIEVE is the sentence. In the same way English has sentences consisting of nouns and verbs, RETRIEVE has sentences composed of the user's data (nouns) that are operated on by verbs that are provided by RETRIEVE. Each sentence may then be stored as part of a vocabulary file.

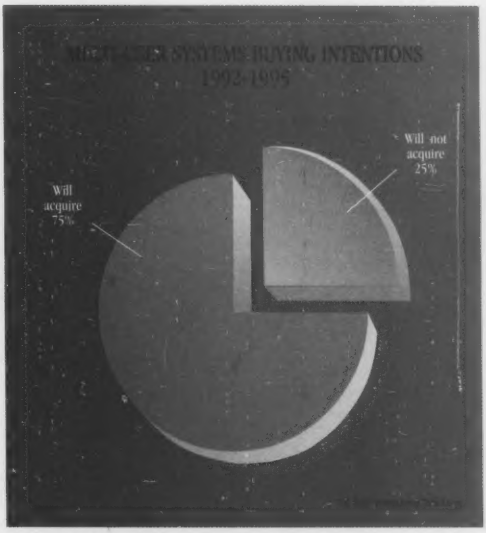
COMMAND LANGUAGE AND PROCESSOR

While its database and file manager is the heart of uniVerse, the command language and processor are the elements most visible to the users. If the system administrator wishes, uniVerse's command language may be as close to the computer as the user ever gets. uniVerse's usefulness is further enhanced by its site-expandable command language that allows users to expand it to meet their individual needs.

The vocabulary (VOC) file is the keystone of the command language and processor. The VOC file contains descriptions of the verbs, key words and files that are available to the uniVerse user. The contents of the VOC file make up the command language. The command processor uses the VOC file to interpret each of the commands as they are entered by users. As is the case with Unix shells, VOC files allow users and/or system administrators to customize the environment. And, as is also the case with Unix's "aliasing" facility, the system administrator may add verbs that, in turn

represent a longer command string.

uniVerse also provides command histories. As with Unix, a predetermined number of instruction lines is maintained in a list. In the case of uniVerse, up to 99 instruction lines can be kept. In the uniVerse vocabulary, each line is a sentence and is stored in the VOC file. Users may then tie together a series of two or more sentences to make a paragraph which, in turn, is stored in the VOC file. Both sentences and paragraphs can be given nicknames. The nicknames are used to execute the actions within the sentence or paragraph. By starting with the smallest components of the command language, users can build a customized language within uniVerse that meets their unique needs.



IDC expects the trend of sites acquiring new multi-user systems and the gains in the acceptance of Unix to spur demand for uniVerse.

PROGRAMMING LANGUAGE

BASIC is the primary programming language for the uniVerse system. However, uniVerse's BASIC is about as close to the interpreted BASIC language used for teaching as a Porsche is to a Model T. While there are some similarities, such as ease of use, uniVerse BASIC is designed for application development. The non-uniVerse BASIC is intended to be a teaching language and not to write commercial applications.

While uniVerse does provide an editor for developing BASIC programs, developers are free to use other editors. Experienced Unix developers will likely opt for VI or EMACS, though any editor that can read and write ASCII files is acceptable. uniVerse's use of ASCII files for programs permits developers to use both Unix and third-party application development utilities such as Source Code Control System (SCCS).

While VMark's BASIC is compiled, it is not compiled in the common sense of the word. Rather than producing executable binary files, the uniVerse BASIC compiler produces an intermediate token stream. It is this token stream that is executed by the BASIC environment. Because the token stream must be interpreted each time the program is executed, it is not as efficient as machine language. However, it is much more efficient than an interpreted environment. Once the program has been compiled, it may be executed with the familiar RUN command.

While the intermediate code is not true object code, uniVerse developers can treat it as such. A program may be catalogued with uniVerse. Catalogued programs are advantageous as they can be called from other code segments and they facilitate the reuse of the code segments.

DISTRIBUTED DATABASE SUPPORT

Information systems installations are distributing their databases across a multitude of platforms. Some sites have worked off a carefully planned schedule. Other sites are forced into distributed environments as departmental and personal systems are added to their networks. As a result, many users do not know or care where their data physically resides. Their overriding concern is that they be able to transparently access the data when they need it.

uVnet is uniVerse's distributed database access scheme. This optional product, using the de facto standard Transmission Control Protocol/Internet Protocol (TCP/IP), permits easy access to data that may be distributed over multiple systems running uniVerse.

VMark has simplified the process of communicating with remote file systems by eliminating the need to provide the full address and file name each time a remote file link is established. A user may insert an entry, which serves as a nickname to the remote file, into the VOC file. Once the VOC file entry is created, the user may refer to the nickname through both command line entries and BASIC programs.

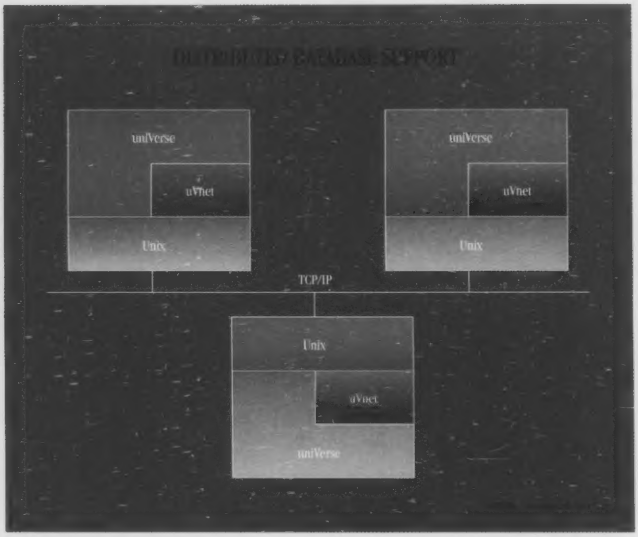
uniVerse's FUTURE

The sites responding to IDC's survey say they do not rely heavily upon VARs and external consultants, which are the leading distribution channels for uniVerse. This is not necessarily bad news for VMark. While the company has its share of large system sites, it is not primarily targeting large firms with internal programming expertise. Instead, it chooses to deliver turnkey software solutions to small-to-medium user sites that lack the ability to write or rewrite programs internally. Clearly, less customized, packaged software solutions based on the more than 4,000 commercially available Pick applications are VMark's mainstays.

VMark must remain extremely aggressive in its efforts to induce Pick developers to port their products to uniVerse. Actually, many uniVerse sites indicate that "port" may be the wrong word in migrating Pick applications to uniVerse. Rather than recounting horror stories of multiple-month or even multiple-year porting periods, many user sites talk of overnight and weekend changeovers.

As Pick sites weigh alternatives to their current Pick environments, Pick/Unix combinations are being considered along with relational database management systems or object-oriented databases. In order to keep their current customers, software houses with Pick applications should support uniVerse.

The port to uniVerse is a "win-win" situation for both software houses and their customers. For the software houses,



Its uVnet function permits uniVerse to communicate with uniVerse databases on other systems.

uniVerse-based products are easily moved from one Unix system to another and they are compatible with a wide range of systems. This compatibility is also an advantage for buyers who may move applications from system to system as hardware platforms change.

In addition to being an application delivery platform, uniVerse is also an application design and development platform. This bodes well for uniVerse, as the IDC survey finds that just under half of the surveyed sites develop their own application software internally.

CASE STUDY: A.M. MILLER

When Bruce Bachman came to A.M. Miller and Associates, Inc., a credit and collections firm, just over a year ago, it was obvious to him that the current Pick software running on a proprietary platform was inadequate and running out of capacity. The situation was so bad that the firm was on the verge of turning away business.

A.M. Miller had been using a Pick Environment for over seven years. According to Bachman, the firm wrote its own accounting and tracking software and was determined to protect that investment. As soon as the decision was made to migrate to a new hardware platform, A.M. Miller chose Unix because it was "universal".

As a Pick user, the firm needed a Pick-compatible software system that ran on top of Unix. After an evaluation of different Pick emulators, Bachman selected what he considered to be the best of the Unix-Pick environments. VMark's uniVerse was implemented in conjunction with Strategic Alternatives, Inc., a Detroit-based VMark distributor. It was implemented on a new DECSystem 5500 running Ultrix.

"We had an overnight conversion," states Bachman. Before that happened, however, he and his staff wisely did a dry run to detect problems. Problems were found. They consisted of differences in syntax between their old Pick system and uniVerse. Once the differences in the syntax were detected, his staff reprogrammed source code and the problems were resolved. What became the overnight conversion could then be done. "We didn't lose a day of business," Bachman declares.

At last count, A.M. Miller is supporting 205 concurrent users on its uniVerse/DEC System. A.M. Miller's business hours run from 7:00 a.m. to 11:00 p.m., with peak demand coming in the late afternoon. In spite of the heavy loads placed on it, the uniVerse/DECSystem remains stable.

Bachman's staff of nine includes three programmers who are responsible for new development and maintenance. Bachman says that, despite beliefs that experienced Pick/uniVerse programmers are hard to find, he has not had a problem finding them.

Bachman's approach to uniVerse and Unix has been a fairly traditional play on the strengths of both components. He uses uniVerse as a platform for both application development and delivery. Unix is employed for connectivity and system management. Bachman says that A.M. Miller also recently linked an Ethernet with six PCs to its DECSystem.

CASE STUDY: OCEAN COUNTY LIBRARY

The Ocean County Library, based in Tom's River, N.J., is typical of organizations that are completely dependent on VARs and systems integrators for their systems. The library's David Slater indicates that his institution's Hewlett-Packard 9000/857S supports 230 users. Regarding uniVerse and Unix, he says he is happy to realize the benefits of both without having to access the inner workings of either.

Ocean County Library is in an envious position. It is able to rely on one vendor, Dynix, Inc., to provide software that, when written on top of uniVerse, permits ease of use for over 200 users. Dynix is solely focused on turnkey applications for libraries. Using this uniVerse/Dynix solution, the library is not forced to develop costly internal expertise.

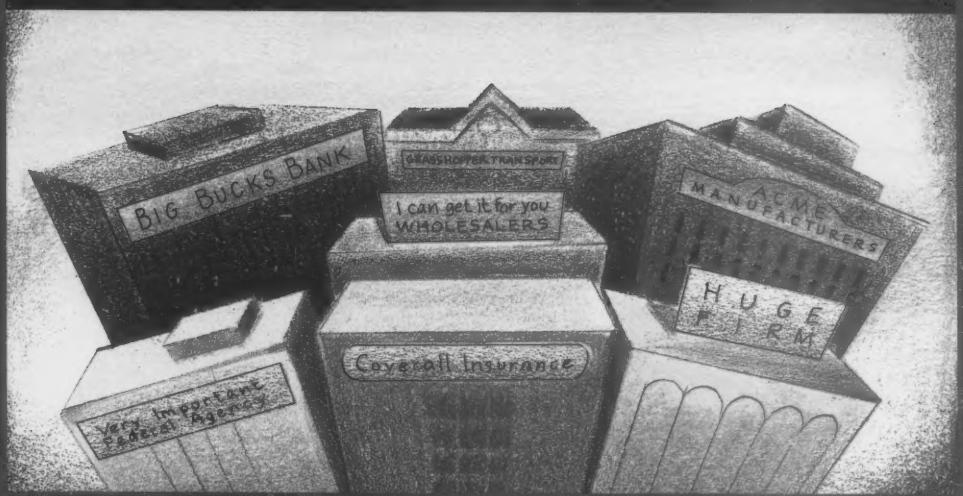
SUPPORT FOR CRITICAL COMPONENTS

uniVerse has many of the capabilities sites surveyed by IDC rate as either critical or highly desirable. Survey respondents say the three leading requirements for application development environments are: a query language (63 percent), connectivity to other databases (57 percent) and distributed databases (44 percent).

uniVerse meets that first requirement with RETRIEVE. However, while uniVerse does offer database connectivity via uVnet, it is currently only across different uniVerse platforms.

IDC believes that some corporate

BIG OPENING FOR PICK USERS.



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ADVANCED COMPUTING ENVIRONMENT

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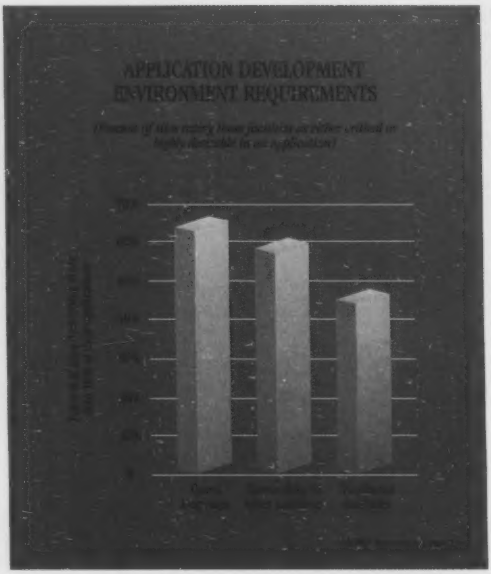
DIGITAL. THE OPEN ADVANTAGE.

mainframes, be they small-scale systems supporting 12 users or large-scale systems supporting over 200 users, may come to act as database servers in addition to performing their other duties. This change combined with the increasing amounts of data on remote systems will drive the demand for database connectivity through at least the mid-90s.

VMark understands that this connectivity will require it to offer a standardized Structured Query Language (SQL), as well as give the uniVerse-based system the ability to participate as a member of a heterogeneous network. To this end VMark is following the lead of the SQL Access Group, which was formed to address compliance with the group's standards, as they become available.

A major strength of uniVerse is in its ability to promote the development and delivery of vertical applications in an effective and timely manner. This has been the case since the inception of uniVerse, and its strength in this area has recently been enhanced by the implementation of user-oriented features such as the Motif-style graphical user interface capability for PC look and feel, transaction logging and recovery for data integrity, and distributed database capability for today's ever-broadening topologies. These features serve to contemporize what uniVerse (and before that, Pick) solution providers have done successfully for a long time. These people bring to the user the ability to tailor their software to operate consistently with business requirements rather than the reverse. Most of VMark's 150 VARs have either a vertical or functional (such as systems integration) specialty. As uniVerse continues to move into open systems and embraces these standards, this customer-oriented expertise will be focused squarely on the open systems user.

One of the common beliefs regarding Pick-like systems is that it is difficult to find developers that are familiar with the environment. As a native Unix application, uniVerse has skirted this issue because developers work with Unix, not Pick, if and when they need to access the operating system.



uniVerse includes a standard query language and optional distributed database capabilities.

VMark proposes using Computer-Aided Software Engineering (CASE) tools to generate applications. However, if this is the plan, VMark must be able to provide methodologies that are accepted across a wide variety of platforms, be they databases or operating systems.

IDC believes VMark's support of SoftBench technology as developed by Hewlett-Packard is correct. SoftBench technology allows users to pick and choose SoftBench-compliant products from various vendors to assemble a CASE environment that meets their specific requirements. IDC believes that established CASE vendors with SoftBench-compliant products, such as Interactive Development Environments and Cadre, would be appropriate partners for VMark to establish relationships with. SoftBench technology is available or announced on HP, Sun and IBM Unix platforms and is expected to be announced for other platforms this year.

SUMMARY

IDC believes that uniVerse is positioned to play a meaningful role in the ever-expanding Unix market. Users that are looking for turnkey applications are well advised to consider a uniVerse-based application. Considering the fact that some Pick-based programs that can run on uniVerse have been evolving for over 15 years, it would be hard to find such mature and functional applications elsewhere.

Despite its advantages, however, uniVerse still faces some challenges. VMark must persuade VARs, IS software developers and potential users that uniVerse has staying power and will continue to evolve along with Unix. In order to stimulate ongoing application development, VMark must educate them regarding uniVerse capabilities in the open system environment.

VMark must employ three strategies. First, it must continue to successfully cultivate the developers of the more than 4,000 Pick applications. These people should be encouraged to keep porting to uniVerse, and to actively update their software by implementing the latest technology that Unix has to offer. This will keep the company 's lifeline of mature solutions evolving and flowing.

Secondly, in order to cultivate new solutions, VMark must realize that not the whole world will speak uniVerse. As it would not be practical to support all of the various dialects of SQL at this time, VMark is correct in taking direction from the SQL Access Group.

Finally, VMark should align with one or more major third-party CASE vendors. This will bring the prestige of these vendors into the equation, and produce faster and easier transitions for first-time uniVerse developers.

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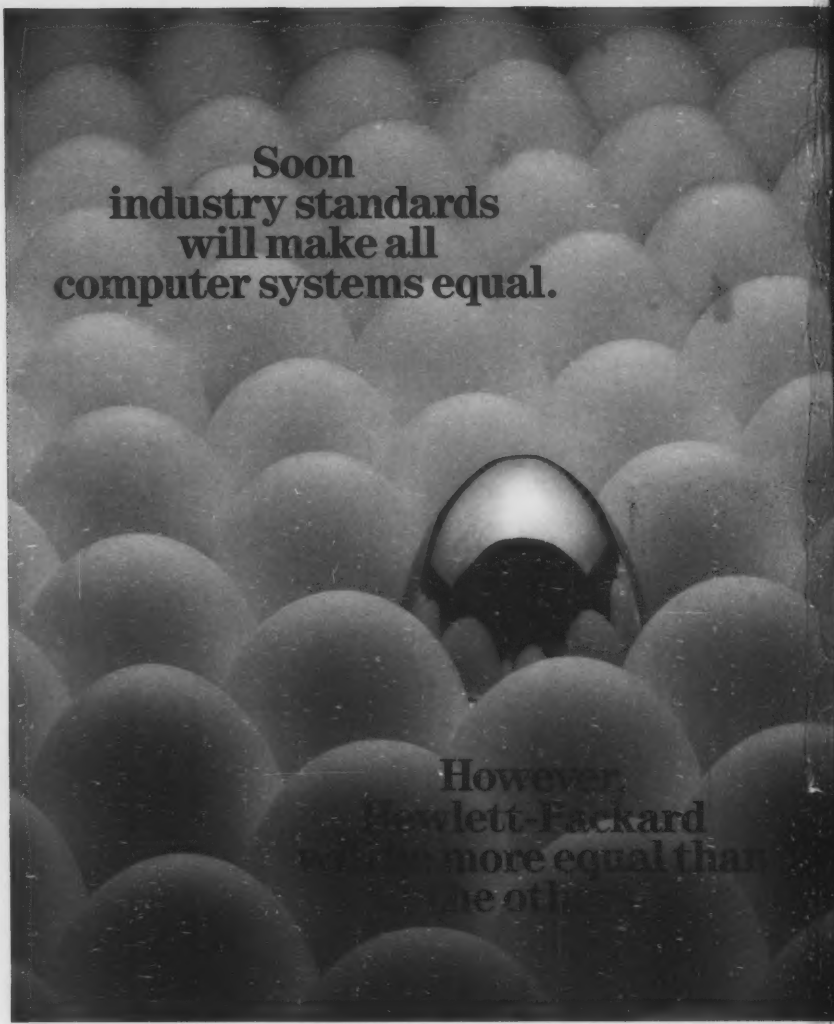

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New HP boxes expand options

ANALYSIS

BY MARYFRAN JOHNSON
CW STAFF

When Hewlett-Packard Co. crashed the party two weeks ago with a pair of top-speed, low-end HP 9000 Series 700 workstations, the vendor did more than drop a few hot Unix boxes into that $5,000 to $10,000 "sweet spot" in the market.

More significantly, HP broadened user options with its accelerated push to pair up its line of X terminals with the high-performance Series 700 workstations. Last week, HP added key networking features to its X station server software to enhance support for remote work groups, improve network security and open the terminals to a broader range of input devices.

Sets HP apart

Analysts said this strong emphasis on X terminals gives HP an important differentiator in the market share battles with Sun Microsystems, Inc., IBM and Digital Equipment Corp.

"Most of the workstation vendors would tell you otherwise, but the world really does want X terminals," said Robert Herwick, an analyst at Hambrecht & Quist, Inc. in San Francisco. "When a large organization is populating hundreds or thousands of desktops, a difference of a couple thousand per desktop makes a big difference."

X terminals (or X stations) are diskless, intelligent terminals designed to run X Window System software, allowing users to access and view applications that run on client workstations. The notion of mixing X terminals into workstation networks is an increasingly interesting option to many users, particularly those with excess workstation capacity and battened-down budgets.

"Many people bought more power than they need, so a number of workstations out there are underutilized, and that power is available," said Eileen O'Brien, an analyst at International Data Corp. in Framingham, Mass.

Northrop Corp.'s information services center in Hawthorne, Calif., is now installing nearly 300 HP 700/RX terminals. The aerospace and defense contractor decided that while mechanical engineers may need full-function workstations, "about 80% to 85% of the other workstations could be the X terminal variety," said Harold Hickman. director of data center operations.

"We started getting the notion that since most of our activities didn't need full capabilities, X terminals should be the way we did it in the future," Hickman explained.

Still, X terminals do raise a number of concerns about their impact on client workstation performance, network traffic and system management.

"We're trying to understand, as a commercial user, what X terminals would really mean to us and our applications," said Barbara Kostanick, MIS director of Consumer Health Services, Inc. in Boulder, Colo.

Continued on page 54

X strategies

Each of the major workstation vendors has forged a different strategy when it comes to selling X terminals.

- HP closely links its 700/RX line with its Unix-based Series 700 workstations, offering customers "two-seater" and "multiseater" deals, configuration testing results and specialized networking software.
- DEC pushes its line of X terminals as alternatives to ASCII and graphics terminals.
- IBM sells a majority of its X terminals to customers buying midrange or high-end RISC System/6000s, hanging them off of the RS/6000s more like terminals off a minicomputer.
- Sun, the one vendor without its own line of X terminals, rejects X terminals and encourages users to buy low-end workstations instead.

Harvard Graphics faces fight in Windows market

BY CAROL HILDEBRAND
CW STAFF

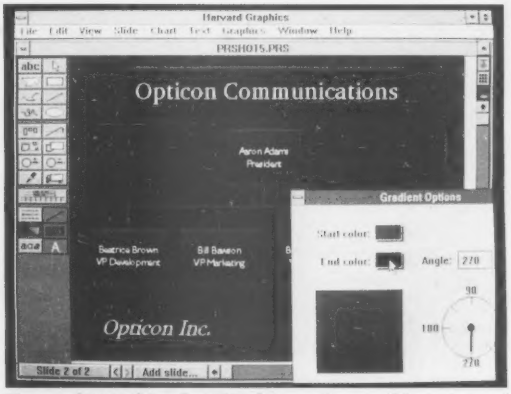
As the presentation software market grows crowded with a host of equally feature-rich products, one thing has become clear: It ain't the product power, it's the marketing motion that'll make users want to buy. And SPC is spoiling for a fight.

Software Publishing Corp., whose Harvard Graphics presentation package rules the DOS market, was one of the last onto the field with a Windows-based product, announced late last year. Now it faces some heavyweights in its quest for a large share of the Windows market.

"There's not enough growth to accommodate everyone. [The market] is getting to be pretty much at a parity level," noted Bill Coggshall, president of New Media Research, Inc. in Los Altos, Calif. "It's more of a marketing game than a features game." For example, such tactics as Microsoft's bundling of Powerpoint, Excel and Word into one Office package is garnering Powerpoint a substantial user base, he said.

"It's first and foremost a slugfest, and we are going to give no quarter," said Fred Gibbons, SPC's president and chief executive officer. Gibbons said he is confident that having beat out the likes of Lotus Development Corp.'s Freelance and Microsoft Corp.'s Powerpoint in the DOS arena, the company can do it again with Windows. Gibbons

Continued on page 60



Harvard Graphics for Windows *offers a slide sorter and enhanced presentation as well as more standard features*

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Autoclerk PC kiosks enlisted as LA's very own 'robocop' team

BY JIM NASH
CW STAFF

LOS ANGELES — Leave it to Southern California to mix networking with equal parts Judge Wapner and Max Headroom, two unique video icons born here in the 1980s.

Next month, the county of Los Angeles expects to introduce Autoclerk, a system that uses personal computers manned by a recorded human face to process traffic- and parking-ticket transactions.

As part of a one-year pilot, two royal-blue, 7-ft kiosks stationed outside the Long Beach Municipal Courthouse will coach accused scofflaws through the process of pleading guilty and paying their fines or scheduling court dates. The project began in February 1991.

Minus the bored stare usually given by a clerk while the accused fumbles for an alibi, "Autoclerk can do anything a human clerk can do," said Jim Weaver, L.A. County court administrator. It will accept Visa payments, bank debit cards and personal checks, make court appointments, explain the rationale behind bail amounts and even tutor people on the ins and outs of small-claims court.

Efficiency needed

Weaver said the county needed a system to make traffic court more efficient. L.A. County issues 90,000 to 100,000 citations for moving violations each year, in addition to 25,000 parking tickets. Active citations can be as old as eight months.

As far as Weaver knows, Autoclerk is the only system of its kind in the nation. It consists of an IBM Personal System/2 Model 70 with 2M bytes of random-access memory emulating sessions with an online IBM Application System/400 Model D75 at the courthouse and an IBM 3090 at the county's data center in Downey. Each kiosk holds a small printer for receipts, a keypad, a depository and a credit-card reader.

What truly sets it apart from other remote-access computers, however, is Victor, the color visage of an actor who takes graphical user interfaces one step further.

"He's the guy behind the counter," said Paul Kennedy, vice president of software development at multimedia hardware and software maker North Communications, Inc. in Santa Monica, Calif., which built the kiosk system under a $360,000 contract.

The actor was videotaped answering every conceivable question someone could pose while navigating the computer system or the traffic and small-claims courts. Victor's image is stored on a Pioneer 8000 laser disc player socked away in the 800-pound, bulletproof kiosk. A touch screen will be installed to limit the need to use the keypad.

Paid for by taxes, the system allows people to access the county's 3090 mainframe traffic and parking-violation database, which holds information from each of the 24 municipal courts in the county.

The AS/400's primary role is to run software that calculates bail amounts and another application that schedules court appearances. It can also act as a holding tank for transactions when the 3090 connection is interrupted for some reason.

BT North America, Inc. is providing the software that links the county's computers and the credit card networks run by BT's value-added network, BT Tymnet. As with any other credit card transaction the firms facilitate, BT tracks and records all traffic around the network.

Due process

The system will prompt neophytes as they try to determine what they owe on a ticket, and it will explain how the fine amount was set. For example, Kennedy said, Victor might say that a ticket for speeding and a faulty headlight costs $100. That amount would fall if the user can deposit, in the kiosk, proof that the headlight has been fixed. Once the deposit has been picked up by a person, the database record reflects the transaction.

"The virtue of Autoclerk is that you don't have to give up your options" in order to take care of a violation, he said. "You don't have to meet our schedule to have due process."

Weaver, who said he is confident of success, is already planning further services for the system, including sale of birth certificates and actual filing of small-claims suits.

Alan Levenson

The face that greets *accused traffic violators and others at the Long Beach courthouse soon won't be Weaver's*

PC & WORKSTATION SHORTS

Adobe founders win Macintosh award

Adobe Systems, Inc. co-founders Charles M. Geschke and John E. Warnock were named winners of *Macusers* 1991 John J. Anderson Distinguished Service Award, which honors enduring individual achievement in the Apple Computer, Inc. Macintosh industry. The 1991 Derek Van Alstyne Rising Star award went to Randy Ubillos, a programmer who wrote the first version of a digital video software program, now known as Premiere, that Adobe markets. The awards are named for the two *Macuser* editors who perished in the 1989 Loma Prieta earthquake.

The mass-market distribution channel recently got another convert as **Zenith Data Systems** announced a new family of personal computers aimed at that market. The boxes — which come bundled with DOS, Microsoft Corp.'s Windows, Spinnaker Software Corp.'s PFS:Windowworks and the Prodigy service — range from a 20-MHz Intel Corp. 80386SX-based notebook with a 60M-byte hard drive to four desktop PCs that start at a 16-MHz 386SX-based model and top out at a 25-MHz I486SX box with a 120M-byte hard drive. The line of products is expected to hit the shelves in April.

Symantec Corp. has updated the Norton Antivirus program with a new application that finds and repairs more than 1,000 DOS- and Windows-related viruses and strains. Version 2.0 sells for $129.

New New New New New New New New New New New New New New New New New New New New New

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Quarterdeck explains Desqview/X delay

BY CHRISTOPHER LINDQUIST
CW STAFF

SANTA MONICA, Calif. — First announced in May 1990 for shipment that fall, Quarterdeck Office Systems, Inc.'s X Window System version of its popular Desqview multitasking software has yet to materialize. However, company President Therese Myers now says the product will ship sometime in the first quarter of 1992.

Myers, a Quarterdeck co-founder, said the delays were related to additional developer requests, including ease of use.

Quarterdeck first released a technical specification for Desqview/X in August 1990. Recent demonstrations of the system at trade shows, as well as agreements with Adobe Systems, Inc. for font technology and Rational Systems, Inc. for a DOS extender — both of which are to be integrated into the X-based product — seem to indicate that Desqview/X is still moving ahead.

Myers said the delays resulted from an effort to keep developers interested in programming for the environment, which will allow both remote and local access to DOS and Unix X programs as well as provide a graphical user interface (GUI) for text-based Desqview.

The first delay, which prevented the fall 1990 release, resulted from the announcement of Release 4 of the Open Software Foundation's X standard. Desqview/X was based on Release 3 at that point.

"The perception was that Release 3 wasn't good enough," Myers said. "Release 4 came out and we had to re-port."

A summer 1991 ship date was missed while Quarterdeck waited for the release of Microsoft Corp.'s MS-DOS 5.0, which Myers said the company expected in March. When MS-DOS 5.0 did not ship until June, the release was put on hold until the fall in order to provide developers with the built-in font, printing and DOS extender support that the Adobe and Rational deals would provide.

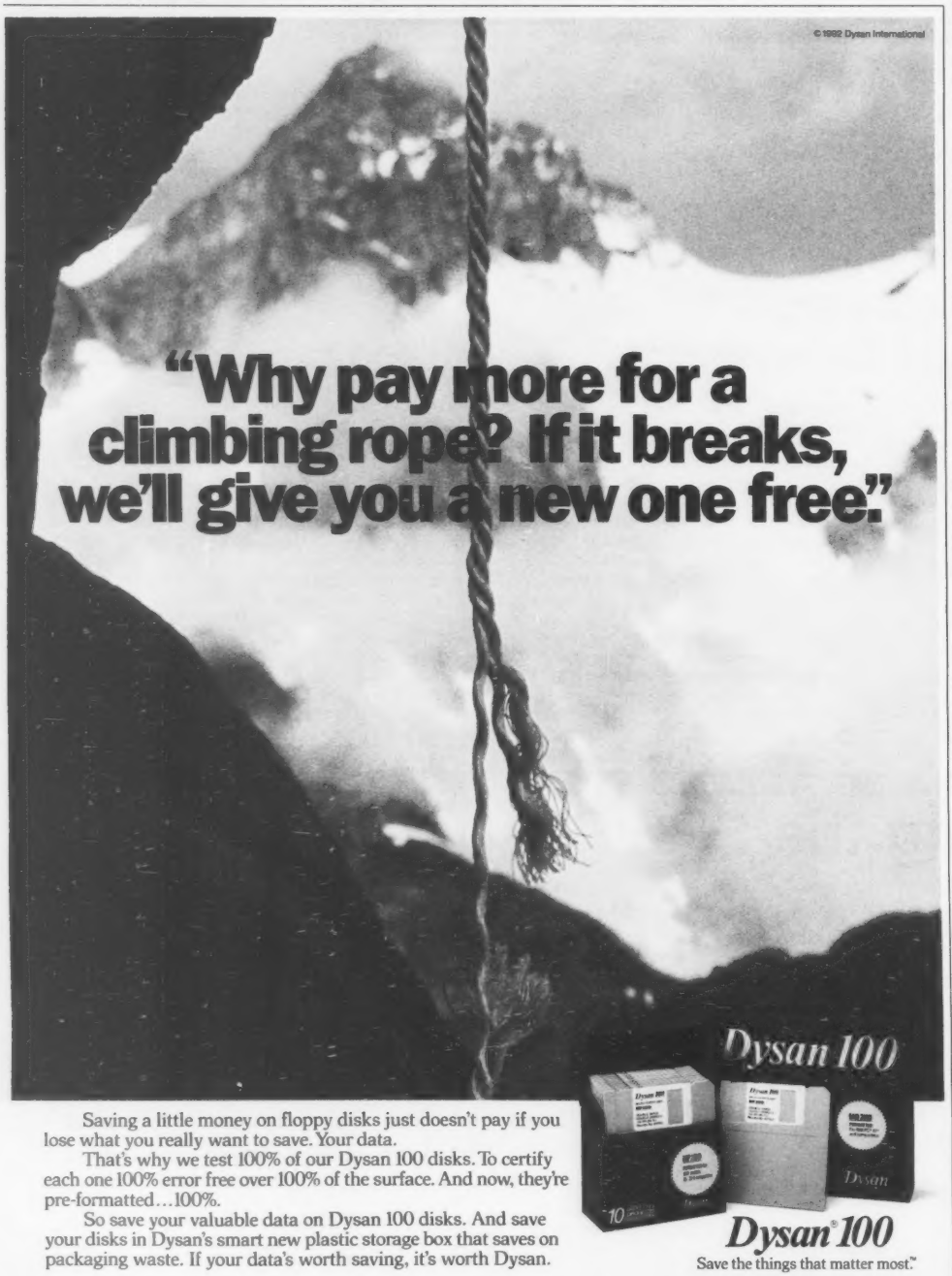
The fall date fell by the wayside as Quarterdeck developers attempted to reduce memory requirements.

All the decisions to miss shipment dates were made with one thing in mind, Myers said: "We said, 'We get one shot at this thing as a developer environment. We aren't going to get a second shot.' "

Desqview users voiced mixed opinions on the welcome the product will receive if and when it does ship.

Some users said they have no current use for the product. However, Rocky Graham, an engineering associate at Dolby Labs in San Francisco, said he hopes Desqview/X will make his life easier. "We have a mixture of machines I need to work on and have access to. Desqview/X sounds like the ideal solution for me."

Other users appear to have given up. "We were interested in it," said Kent Curtis, manager of software at Four PI Systems Corp., a maker of automated X-ray inspection equipment in San Diego. But "some of the features they [were to] have offered have been swept away by the Windows avalanche."



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New HP boxes expand options

CONTINUED FROM PAGE 51

Consumer Health, which runs a nationwide service matching patients with doctors, uses a large network of Sun servers and workstations to support 150 to 200 service representatives who handle 1 million calls annually at the Boulder headquarters.

"My users are all on ASCII terminals, with all our applications built with our own windowing interface. How are people really going to work in an X terminal environment?" Kostanick asked.

Although she is now considering a pilot project involving X terminals, she said vendors still fail to make a business case for the technology. "They're not doing a very good job of communicating with commercial customers," Kostanick said.

The X terminal technology, only a few years old, is maturing at a brisk clip, however. That was evident last week in San Francisco at Uniforum, the Unix industry's largest trade show.

Several vendors are scrambling to introduce color terminals to their lines or bring out second-generation machines powered by reduced instruction set computing technology.

Athenix Corp. in Sunnyvale, Calif., for example, announced it was entering the X terminal market with new shared-controller technology. It planned to pitch its products to the mainstream commercial market.

This year promises to be a lucrative one for the X terminal market, said Stephen Auditore, president of the X Business Group in Fremont, Calif. X terminal revenue grew to $358 million in 1991 from about $160 million the year before. "The market has not grown as rapidly as anticipated," he acknowledged, "but it's starting to catch on in more traditional data processing environments."

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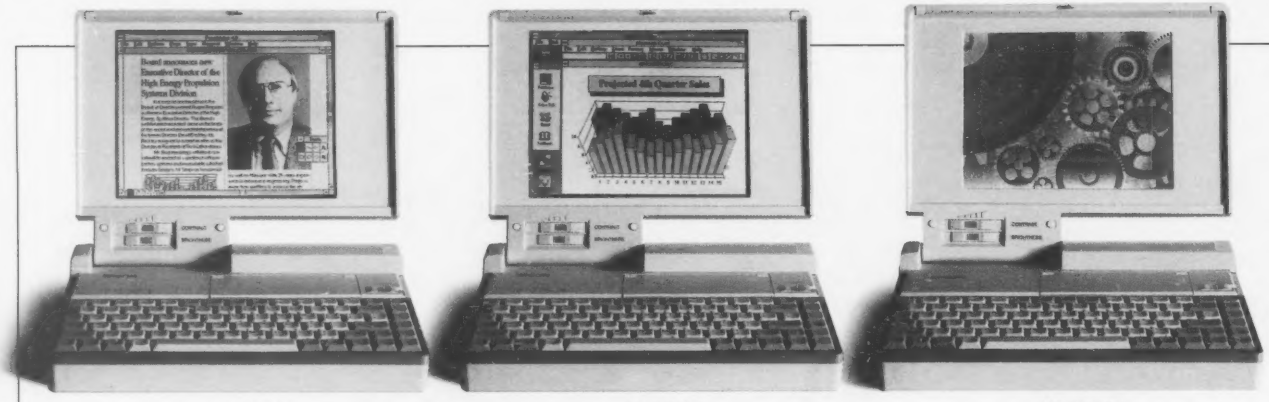

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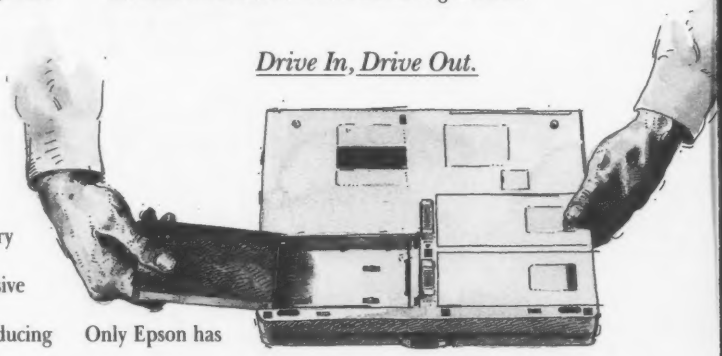

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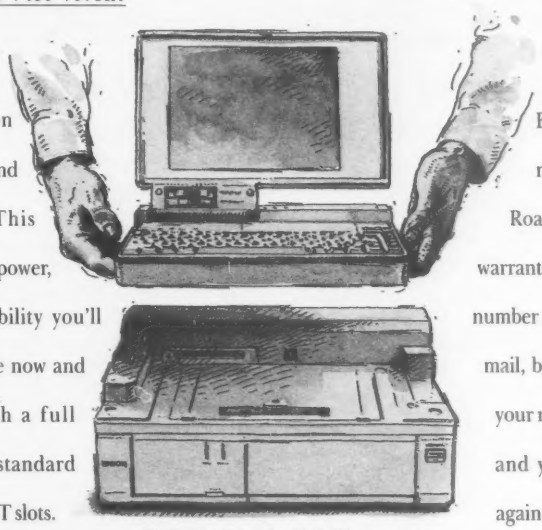

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Lotus 1-2-3/Mac: Intuitive, user-friendly

Technology Analysis — A roundup of expert opinions about new products. Summary written by free-lance writer Suzanne Weixel.

Lotus Development Corp.'s 1-2-3 for the Apple Computer, Inc. Macintosh makes a smooth transition to the Apple platform without compromising the functionality of the popular DOS version.

Ease of use: Visual tools such as movable palettes and customizable menus make 1-2-3/Macintosh more intuitive than the DOS package.

Performance: What it lacks in speed, 1-2-3/Macintosh makes up for in compatibility. Users can import files from previous versions as well as those from Microsoft Corp.'s Excel. The package supports System 7.0.

Output: Charting features, drawing tools and graphics options are extensive, flexible and well thought out. There are true three-dimensional chart types; chart elements are treated as discrete objects.

Analysis: 1-2-3/Macintosh has basically the same analytical features as 1-2-3 Version 3.1 for DOS, including backsolver, the ability to edit within a cell and support for 3-D spreadsheets.

Value: 1-2-3/Macintosh ($495) combines cross-platform mobility, strong analytical tools and solid performance into an easy-to-use and familiar package.

Lotus 1-2-3 for Macintosh

Reviews	Ease of use	Performance	Output	Analysis	Value	Overall
Infoworld 8/19/91	Long on compatibility	NC	Flexible tools	Best functions	Impressive	Keeps its promise
Mac Week 12/17/91	No translation process	NC	Has range of graph types	In-cell editing	Mac and PC users should consider	Supports Mac requirements
PC Week 8/5/91	Strikes effective balance	NC	Extensive features	Simplifies complex models	NC	Gives Excel a run for its money
Users						
Patricia Elste, Pacific Gas Transmission Co.	■■	■▪	■▪	NC	■▪	Cross-platform compatibility to the letter
Donald Adams, Armin Molding Corp.	■■	■■	■▪	■■	■■	Charting could be better
John Walker, NASA	■▪	■▪	■■	■■	■■	Has some unique features
Analysts						
David Seachrist, National Software Testing Labs	■■	■▪	■▪	■▪	■■	Very accessible interface
Richard E. Meyeroff, Meyeroff Computer Consultants	■▪	■▪	■▪	■▪	■▪	Lacks some features but very nice
Peter Francis, Dataquest, Inc.	■▪	▪	■▪	■■	■▪	Too large

Key: ■■ Very good ■▪ Good ▪ Fair ■ Poor Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment.

Vendor financial ratings

Analysts	Long-term stability	Short-term performance
Alfred Tobia, Mabon, Nugent & Co.	■▪	■▪
Carlo Cannell, Gruber & McBaine Capital Management	▪	▪

Third-quarter results for Lotus were revenue of $218.8 million, a 37% increase over 1990, and net income of $21.5 million, a 151% increase over 1990's third-quarter income of $8.6 million.

Lotus responds

Rob Adams, senior product manager:

Performance: 1-2-3 for the Mac's calculation time may seem slow, but it still takes less time to accomplish a complete task because the program is so intuitive to use.

Ease of use: We developed the 1-2-3 for the Mac interface by asking Mac users what they wanted. They didn't want a customizable icon palette.

Informix's Wingz: A fast but bumpy ride

Informix Software's Wingz 1.1A

Reviews	Ease of use	Performance	Output	Analysis	Value	Overall
PC Week 5/27/91	Satisfactory	NC	Good	Good	NC	Powerful, but limited accessibility
Mac Week 9/17/91	Multiplatform compatibility	Powerful	NC	NC	Perennial runner-up	Wide range of capabilities
*PC Magazine** 12/31/91	NC	Among the fastest	Charting features abound	Lacks advanced features	NC	Shines in applications development
Users						
Mark Shier, Datasource Corp.	■■	■■	■■	■■	■■	Powerful
Scott Teeter, Electronic Data Systems Corp.	■▪	■▪	■■	■▪	■■	Hyperscript makes life easy
Michael Zill, Motorola, Inc.	■▪	■■	■■	■■	■■	There's nothing close to Hyperscript
Analysts						
Peter Francis, Dataquest, Inc.	■▪	■▪	■▪	■▪	■▪	Good package that never caught on
Richard E. Meyeroff, Meyeroff Computer Consultants	■▪	■▪	■■	▪	▪	Good programming language
Rochelle Theophano, Datapro Research Corp.	■▪	■■	■■	■▪	■▪	Strong cross-platform support

Key: ■■ Very good ■▪ Good ▪ Fair ■ Poor Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment. **PC Magazine* rated DOS version.

Vendor financial information

Informix Software, based in Menlo Park, Calif., reported third-quarter 1991 revenue of $48.3 million and net income of $4.7 million. This compares with revenue of $37.9 million and a loss of $4.2 million for the same quarter in 1990. Financial analyst Charles Phillips at Soundview Financial Group rated the company's short-term performance as very good and its long-term stability as good. The company has been on the rebound, Phillips said.

Informix responds

Wingz marketing manager:

Ease of use: Improving the user interface is a top priority for our next release. For instance, we plan to organize the menus better.

Analysis tools: We plan to add the tools offered by other spreadsheet packages, such as a solver. As for database operations, Wingz can be used as a front end to the Informix database products.

Informix Software, Inc.'s Wingz for the Apple Computer, Inc. Macintosh may not be the easiest spreadsheet package to use, but reviewers said the combination of its powerful programming language and the Macintosh's interface make it an intriguing product.

Ease of use: Wingz' interface makes use of status bar icons and menu trees. Reviewers said the interface is not straightforward. Novices will appreciate the English-like syntax of the Hyperscript programming language for writing macros. Creating complex macros is a challenge.

Performance: Wingz' speed on the Macintosh is quite good. It is compatible with System 7.0.

Output: According to reviewers, Wingz offers more charts and formatting choices than any other spreadsheet, enabling presentation-quality output. A drawback is that manipulating pieces of charts can be confusing.

Analysis: Spreadsheet auditing is not very powerful, reviewers said. There is support for matrix math and inversions as well as frequency distribution, regression and what-if table analysis. However, there is no solver or backsolver function. Data consolidation features and database operations are limited.

Value: Wingz ($399) shines at charting and formatting, and its support for many hardware platforms is convenient.

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Show reveals pen computing ready for blast-off

BY MICHAEL FITZGERALD
CW STAFF

BALTIMORE — The question at the recent Pen Computer Users Conference was not if but when pen-based computing will take off.

Bruce Stephen, director of personal computer hardware and pricing research at International Data Corp. in Framingham, Mass., set the tone of the conference by saying in his presentation that it is only a matter of time before pen computing happens. Indeed, users of the nascent technology were there to discuss their projects, and the majority of the approximately 240 user attendees seemed eager to begin pilot projects of their own.

Two users of Grid Systems Corp.'s Gridpad described their projects to the conference. Both user projects focus on automating forms to improve data input in a field environment — what many expect will be typical examples of early pen-based computing applications.

At CSX Corp., a $7 billion transportation company based in Dallas, a Gridpad pilot has been under way to collect data on truck deliveries, according to Dorothy J. Cranshaw, vice president of information technology.

Cranshaw's group recently completed its pilot and plans to purchase 400 Gridpads this year.

Cranshaw stressed a recurring theme at the conference: Users can have heavy influence on the systems being built, perhaps more influence than they have previously experienced. "It's very easy to work closely with a vendor on these types of projects," she said.

Brenda J. Taylor, director of test support at the U.S. Army's Electronic Proving Ground in Fort Huachuca, Ariz., outlined how Gridpads helped her group dramatically improve some data input tasks, including one project that went from requiring 18 people for a 36-hour turnaround to needing three people for a one- to two-hour turnaround.

Most analysts have said they do not see pen computers shipping in significant quantities until 1994.

Pen pilot plans

Numerous users spoke of their plans for pilot pen projects.

Roy A. Gregory, manager of personal computing at Scrivner, Inc., a privately held $6 billion grocery wholesaler in Oklahoma City, said he would like to give pen-based systems to as many as 100 keyboard-phobic executives with heavy travel schedules for use as both personal time managers and information gathering tools.

Gregory said he would buy systems "today," if he could find one that met his needs. "It has to be based on a 386, and it has to look professional," he said. "Do you see executives carrying around plastic clipboards? No."

Gregory emphasized, however, that he was not frustrated by the lack of existing shipping products, largely because most vendors have been up-front about not being able to ship until the end of the first quarter.

Similarly, Michael Finnegan, project manager at Salomon Brothers, Inc., said the company wants to start a pilot in the second quarter that will tie pen-based systems into an imaging system the company is installing for its dealmakers. Salomon will use the pen systems for signature capture to decrease the amount of paper it uses.

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Harvard faces Windows fight

CONTINUED FROM PAGE 51

said that an emphasis on OS/2 development caught SPC short on the Windows platform, but he did not think the product's tardy entrance will hurt it.

Harvard Graphics for Windows contains many of the features rapidly becoming standard for a Windows presentation product. Its slide sorter allows a user to view the entire presentation within one window and change the order of slides with a click of the mouse.

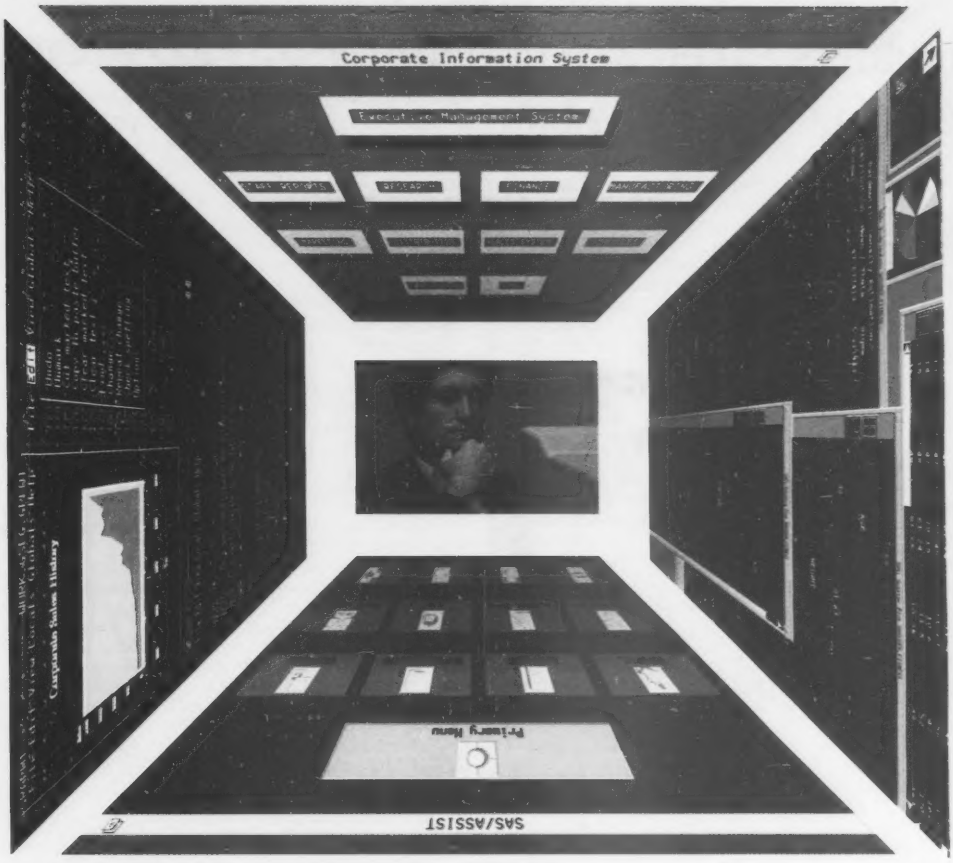
Fifty-four templates, which SPC calls Presentation Styles, let a would-be presenter pick one uniform style and carry it throughout the slide show.

Users can create presentations either textually or visually by choosing to work with the Outliner or the Slide Editor, respectively.

One interesting twist Harvard Graphics offers is the enhanced presentation quality. Through a feature called Launch Application, users can run DOS and Windows applications from within the screen show by clicking on a previously defined button.

Dynamic Data Exchange (DDE) links also let users create live data links to other Windows applications to ensure that the data in a presentation will be automatically updated whenever the source data is changed.

Mike McCurdy, an information specialist at British Petroleum International in Houston, said he was very impressed by the DDE links. "I was knocked out by it," he said. "I can really see us taking advantage of that."



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New contenders announced in heavyweight portable division

BY MICHAEL FITZGERALD
CW STAFF

IRVINE, Calif. — Toshiba America Information Systems, Inc., the market leader in heavy portable systems, added power to and cut pounds from its product line last week, while Dolch Computer Systems began shipping its most powerful contender in the category.

Both companies promoted the emerging active-matrix color technology as an option.

Toshiba released four AC-powered portables, the T6400 and T6400SX lines. Based on Intel Corp.'s 33-MHz I486DX or 25-MHz 486SX chip, both come in active-matrix color and monochrome versions, with the color versions weighing 12.9 pounds and the monochrome, 11.7 pounds. Toshiba's current high-end products are the 17-pound T3200SX line (in monochrome and passive-matrix color versions) and the 18.7-pound T5200 and 18.9-pound T5200C (which features active-matrix color). Both of these systems use Intel 80386 processors.

Analysts said there is a market for the new products, despite the attention given to notebooks.

Bruce Stephen, director of personal computer hardware research at International Data Corp. (IDC) in Framingham, Mass., said the market for AC-powered portables would grow to 158,000 units in 1992, up from 143,000 units in 1991 and 134,000 in 1990 (IDC data shows that Toshiba sold 55,000 units in 1990).

"These are for someone who's slightly mobile, you might say — people who go to client sites maybe for a week at a time or only occasionally take their products home with them," Stephen said. He added that active-matrix color remains a high-end technology.

Toshiba will price the machines at $5,699 for the T6400SX with gas plasma screen, $8,499 for the T6400SXC with active-matrix color (both systems have 4M bytes of random-access memory and a 120M-byte hard drive), $6,999 for the T6400 with gas plasma screen and $9,749 for the active-matrix T6400DXC (both DX systems have 4M bytes of RAM and a 200M-byte hard drive). Toshiba expects to ship in mid-February.

Toshiba's T6400DXC *sports 4M bytes of RAM and a 200M-byte hard drive*

Toshiba also said these would not be the last color portables it would ship this year. The company refused to comment on what other products it might offer, but sources close to the company predict that both 386- and 486-based battery-powered products, including one 486-based notebook, the T4400SC, will be delivered in November.

Dolch announced it is now shipping its P.A.C. 486-50E, a 22-pound luggable based on Intel's 50-MHz 486 chip. An active-matrix color screen is also offered.

NEW PRODUCTS

Development tools

Mantasoft Partners has announced the Incontrol Toolbox for Microsoft Corp.'s Windows 3.0 environment.

The product comprises a set of Dynamic Link Libraries for use with development tools including Microsoft's Windows Software Development Kit and Borland International, Inc.'s C++ and Turbo Pascal for Windows. It defines 13 new classes of display and input controls.

The Toolbox costs $179, or $249 including source code.

Mantasoft Partners
3809 Red Bay
Cedar Park, Texas 78613
(512) 335-3497

Carnegie Group, Inc. has released Testbench Version 2.1.

Testbench is a software tool for building expert troubleshooting systems; it is intended for field and customer service organizations. It comprises a development environment module and a delivery environment module. In addition, Version 2.1 includes the client/server capabilities and the Testview delivery environment module for Microsoft Corp.'s Windows.

The development environment module costs between $24,000 and $48,000; the delivery environment module costs between $200 and $800.

Carnegie Group
5 PPG Place
Pittsburgh, Pa. 15222
(412) 642-6900

OS/2 software

Gpf Systems, Inc. has upgraded Gpf, its graphical user interface programming tool for OS/2 Presentation Manager.

Gpf ($995) provides developers with a point-and-click development environment for prototyping Presentation Manager interfaces. Version 1.3 generates 32-bit C language code. It also allows developers to define custom graphical objects for new user interfaces.

Gpf Systems
30 Falls Road
Moodus, Conn. 06469
(203) 873-3300

Software applications packages

Decisioneering, Inc. has released Crystal Ball for Windows, a risk analysis add-in for Microsoft Corp. Excel users.

The software calculates best case, worst case and most likely results based on Excel spreadsheet equations that contain uncertain values, allowing users to predict likely results of financial operations, for example. The utility uses Windows' Dynamic Data Exchange to interact with Excel, and it displays results graphically.

The product costs $195.

Decisioneering
1727 Conestoga St.
Boulder, Colo. 80301
(303) 447-6464

Macintosh products

Cognos, Inc. has introduced Powerplay, an executive information system for the Apple Computer, Inc. Macintosh.

Powerplay provides users with graphical display of data from database and spreadsheet files.

Users can start with general data and drill down to examine particular areas in greater detail. It takes full advantage of Apple's System 7.0 features, according to Cognos.

The software costs $695 for the first copy.

Cognos
67 S. Bedford St.
Burlington, Mass. 01803
(617) 229-6600

Adobe Systems, Inc. has begun shipping Photoshop 2.0.1.

The updated software package is fully compatible with Apple Computer, Inc.'s Quadra systems.

It also features four add-in modules that provide features such as JPEG compression support and creation of special photographic highlights.

Photoshop costs $895.

Adobe Systems
1585 Charleston Road
Mountain View, Calif. 94039
(415) 961-4400

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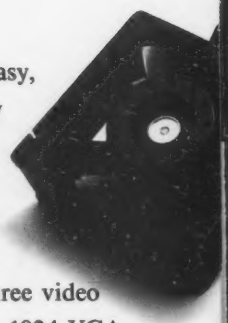

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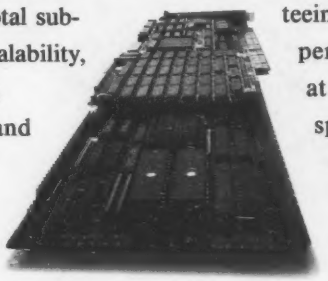

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1. # SIMM sockets (min/max)	16	4	4	NEC
	16	4	4	NEC
2. Maximum RAM capacity	64	64	80	AST
	112	64	80	NEC
3. Internal hard-drive storage capacity	2.7GB	1GB	420MB	NEC
	4GB	4GB	2.4GB	Tie
4. Power supply	285W	240W	167W	NEC
	388W	355W	300W	NEC
5. Internal fans	3	1	1	NEC
	4	2	2	NEC
6. Snap-in device rails	Yes	No	No	NEC
	Yes	No	No	NEC

Data based on manufacturer's published specifications

For more information, call 1-800 NEC-INFO (in Canada, 1-800-343-4418), or NEC FastFacts at 1-800-366-0476, #XPRESS (977377), for immediate literature.

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Wireless feast due at Comnet

Vendors such as Ericsson GE and HP announce modems for palmtops

BY ELISABETH HORWITT
CW STAFF

WASHINGTON, D.C. — The wireless data networking scene is expected to heat up at this week's Communication Networks Conference and Exposition (Comnet) '92, with several vendors making product introductions.

By 1995, more than 25% of the U.S population will regularly use at least one form of wireless communication, which includes cellular services, paging systems, cordless phones and wireless data networks such as radio frequency modems and wireless local-area networks, according to a recent report by The Eastern Management Group. That number should rise to 50% by the year 2001, the Parsippany, N.J., research firm predicted.

Not included in the study, however, were cellular fax and data applications for mobile networks, such as IBM and Motorola, Inc.'s Advanced Radio Data Information Services (Ardis), said John Ahsler, senior consultant at Eastern Management. Adding those applications to the wireless data network figures would pump up that 25% figure by another 15%, he added. And the entry of major players into the wireless data networking market would boost those numbers even higher.

One such player, Ericsson GE Mobile Data, Inc., will introduce Mobidem, its first portable RF data modem. The modem works with Mobitex, an open, packet networking technology for wireless networks developed by Ericsson GE and Swedish Telecom. A nationwide Mobitex network in the U.S. is under construction by Ram Mobile Data, Inc., a unit of Ram Broadcasting Corp.

Also, Hewlett-Packard Co. will show its HP 95LX palmtop computer configured with the Ericsson GE modem.

Through Feb. 15, Ericsson GE will sell the Mobidem, the HP 95LX and an electronic-mail application for $1,999 — $750 off the regular $2,749 price.

The E-mail application, from Anterior Technology in Menlo Park, Calif., lets users access private wireline networks through Anterior's Radiomail gateway.

In addition, Simware, Inc., an Ottawa firm, will announce a software application that enables users to access IBM mainframe resources and applications from wireless personal computers over the Ram Mobile Data network. Pricing details for the software were not available.

BT North America, Inc. will announce wireless access into its Tymnet data network. Mobile users will be able to access Tymnet either with a packet data radio from Motorola and the nationwide Ardis wireless network or over a local cellular voice network. For cellular users, BT will demonstrate the packet-over-cellular technology pioneered by Cellular Data, Inc. in Mountain View, Calif.

Midwest Bureau Chief Ellis Booker contributed to this article.

FCC opens door to allocate airwaves for new technology

BY GARY H. ANTHES
and ELLIS BOOKER
CW STAFF

WASHINGTON, D.C. — The Federal Communications Commission recently announced a plan to open the airwaves to emerging wireless communications technologies such as radio-based local-area networks and advanced mobile telephones.

The commission proposed dedicating 220 MHz of the electromagnetic spectrum to the technologies, and it sketched out a plan to bump existing users such as utilities and railroads to other frequencies or media.

The FCC has not yet said how it will carve up the 220 MHz — which lie in the microwave portion of the spectrum — among competing types of use. In a petition filed with the FCC a year ago, Apple Computer, Inc. asked that 40 MHz be devoted to wireless data networks linking personal computers at distances up to 150 ft.

"The FCC has made a great deal of progress in terms of recognizing the importance of wireless data services and is now saying they'll set aside spectrum," said David C. Nagel, senior vice president in the Advanced Tech-

Continued on page 68

Pizza Hut: Making it great with imaging, EDI

BY ELLIS BOOKER
CW STAFF

WICHITA, Kan. — In the best of all possible worlds, transactions among businesses would all happen electronically, without paper. But electronic data interchange (EDI) has a long way to go before that world arrives.

Just ask Ron Landers, director of expenditure accounting at Pizza Hut, Inc., which uses EDI for some 75,000 of its 175,000 monthly invoices. Landers knows that only a handful of the 90,000 firms Pizza Hut does business with are set up for EDI.

But with an eye to capturing the remaining 100,000 documents electronically, Landers recently installed an electronic document imaging system.

Extra steps

When the Pepsico, Inc. subsidiary consolidated its seven regional accounting offices in Wichita in 1988, Landers' department began working this way: "Vendors sent bills to us here," Landers explained. "We'd open the mail, code the invoices, put three pieces of information on each one and then key the item into our McCormack & Dodge accounting system."

However, he quickly decided to nudge some of Pizza Hut's largest suppliers in the direction of EDI. "In all but one case, we were their first EDI trading partner," Landers said.

Pizza Hut now uses the IBM Information Network for its EDI transactions and hopes to soon implement electronic payment with some of its partners using electronic funds transfer (EFT).

"We stepped back," Landers recalled, "and said, 'We've dealt with 40% of the paper. How do we get the rest?' "

Filenet chosen

After examining available imaging vendors, the accounting unit picked Filenet Corp. in Costa Mesa, Calif.

"The real key to the imaging system," Landers said, "is not the elimination of the paper or the reduction in paper storage costs. It's Filenet's Workflo software." Workflo is a set of proprietary software modules for automating the routing of images and text between people and applications.

At Pizza Hut, Workflo has been used to link the imaging and accounting applications. In the Pizza Hut application, it essentially combines the step of coding the invoice (now an image) and

Continued on page 72

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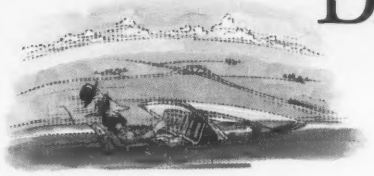
- **Challenge:** Drawing more suppliers into electronic data interchange and reducing reliance on paper forms used by others.
- **Technology:** IBM Information Network and Filenet Workflo software.
- **Results:** An expected 25% productivity improvement, a three-year payback for imaging systems and a 40% reduction in paper volume thanks to EDI.



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FCC allocates airwaves

CONTINUED FROM PAGE 67

nology Group at Apple. "We're still hoping they'll allocate 40 MHz for data PCS, and I'm still very optimistic," he added.

Most of the requests for spectrum for Personal Communications Services (PCS) have been for voice applications such as pocket telephones, and the FCC so far has seemed inclined to let voice and data users share common portions of the spectrum.

However, Apple is urging the FCC to earmark 40 MHz just for data transmission, with data moving in packets, arguing that combining steady voice signals with bursty data traffic is inefficient.

A flexible approach

The commission proposed a "flexible negotiations approach" by which new users would compensate incumbents for the cost of being displaced to higher frequencies or to wire-based technology.

The FCC said such negotiations could occur over a 10- to 15-year period, after which the old users would lose their government protection against radio-frequency interference. In response to protests from public safety officials, the FCC said microwave users in the public-safety sector will not be displaced.

Apple has proposed that wireless data network users require no licenses but that they compensate incumbents through a government-administered fund by paying a surcharge of 4% to 10% on the cost of PCS gear, principally the transceiver that would attach to the personal computer.

According to Nagel, it is difficult to predict applications for a technology that does not yet exist, but he added that data PCS would increase user flexibility and reduce the cost of installing and maintaining LANs.

"It's an extension of plug-and-play; unplug-and-play, actually," Nagel said. "You walk into a room, turn on your portable computer equipped with a data PCS system, and you're on the network with people in the area. There's no one to administer the network. It's spontaneous, an ad hoc network."

Spontaneous sharing

According to Nagel, the technology, which would support multiple 10M bit/sec. networks in one physical space, would enable spontaneous sharing of information at meetings, to which people often fail to bring everything they need. "You have your office with you in the meeting," he said.

Nagel said Apple is currently developing data PCS equipment and could have it on the market within one to two years if the FCC were to approve data PCS today.

Last October, Motorola, Inc. asked the FCC to reallocate some 317 MHz of spectrum for wireless technologies by the year 2000 in order to accommodate the expected explosive growth of wireless applications and users.

The 34 million wireless users today — of which only 15 million represent two-way voice or data users — will grow to 150 million by the end of the decade, according to Motorola.

Motorola officials also played the U.S. global competition chord, noting that Japan is already making some 600 MHz of RF available for advanced mobile systems.

A flurry of activity

What sorts of wireless data applications will buzz across the airwaves in the year 2000? And how many people will use these applications?

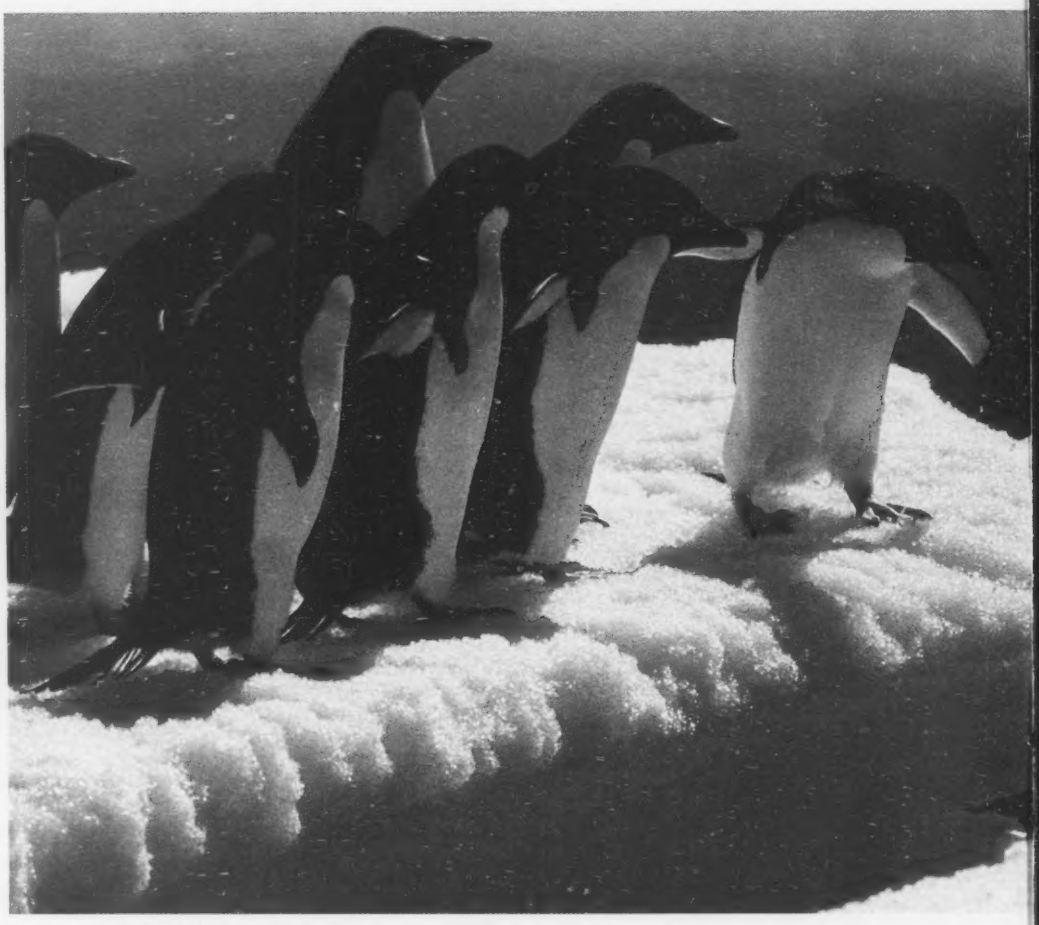
There will be four categories, according to Booz Allen & Hamilton, Inc., which has made the following predictions about the size of these market segments by the year 2000:

- Field service, field support and logistics. These applications are epitomized by package delivery companies that equip their trucks and field personnel with wireless systems.
  Prediction: 2.2 million users.
- Corporate. These applications will involve white-collar sales personnel in the field.
  Prediction: 1.8 million users.
- The mobile office. Represented by notebook, laptop and pen-based computer users, the principal driver for this group will be electronic mail and host access.
  Prediction: 5.9 million users.
- Personal communications. This catch-all category includes personal E-mail and news, financial, sports and weather reports on portable devices. This last leg of the wireless market could become the biggest.
  Prediction: 3.5 million users.

The years 1994 and 1995 will be key for building the hardware, software and network infrastructures necessary for ubiquitous wireless systems, according to Gib Hoxie, partner in charge of the West Coast information industry practice at Booz Allen.

ELLIS BOOKER

One of us has to



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Wireless technology pulls its weight in palmtop market

BY ELLIS BOOKER
CW STAFF

Palmtop computer makers have embraced wireless networking as a logical extension of their products.

However, the size, weight and cost of adding a wireless capability to a palmtop may consign this attractive add-on to specialized niche applications for the time being, according to industry observers.

The value of a wireless capability for a palmtop is "proportional to the weight of the portable modem," observed Mark Eppley, chief executive officer of Traveling Software, Inc. in Bothell, Wash.

"If the modem outweighs the palmtop, that defeats the purpose," Eppley explained.

Put another way, the reason users choose a palmtop in the first place probably has a great deal to do with its size (most are about 6½- by 3½- by 1-in.) and weight (most weigh less than 10 ounces).

For his part, Eppley said he bets that two-way, wide-area network communications will not be as abundant as wireless local-area networks. The wireless LAN will make the transfer of data between a new generation of so-called "companion PCs both seamless and cableless," Eppley said.

Among vendors with existing wireless networking capabilities for their palmtops are Hewlett-Packard Co., Sharp Electronics Corp., Poqet Computer Corp. and Psion, Inc.

Andy Seybold, editor of "Outlook on Professional Computing," suggested that wireless connectivity could change the dynamics in the laptop industry. He argued that the reason many users now tote high-powered notebook computers is because "they feel they have to carry everything around."

Seybold said he thinks such companion personal computers will be more powerful than proprietary pocket organizers are today and will run conventional PC software but weigh less than a 4-pound notebook.

Still, the high cost of two-way wireless modems may make them unappealing to individual users.

For example, this month Psion became the first palmtop vendor to sign up for Motorola, Inc.'s RPM4051 integrated packet data modem. But addition of the modem will more than double the $845 price of the base Psion HC 128K model, according to Tony Revis, president of Psion.

Because of the cost issues, many analysts said the users of wireless systems will continue to be in vertical markets, such as field sales and field service.

However, a mass market is conceivable, given the synergy between wireless networking and portable computing.

"If you look at the list of potential applications [for palmtops] and look at the list of applications promoted by wireless network providers, there's a tremendous overlap," said Alan A. Reiter, group executive editor of a biweekly newsletter based in Washington, D.C.

Motorola takes one-way route

While two-way wireless systems for portable computers are still expensive and heavy, analysts predict that less expensive and lighter one-way devices, which receive incoming messages in much the same way a pager does, will find an audience.

Motorola said it hopes to capture this market with Embarc (electronic mail broadcast to a roaming computer). Embarc uses a dedicated FM paging channel and is scheduled to become operational by the end of the quarter.

Embarc requires Motorola's proprietary Newsstream radio frequency receiver, which attaches to the computer's serial port. About the size of a pocket pager, Newsstream can hold up to 56 32K-byte messages.

Motorola will sell the receiver — plus software, a user manual and a cable — for $395. A basic subscription will cost $15 a month and will include the automatic delivery of news headlines and weather forecasts.

Motorola is also covering its bets. In mid-1990, along with IBM, it launched Advanced Radio Data Information Services, a two-way, nationwide wireless network that now claims 35 corporate customers and 40,000 users.

ELLIS BOOKER

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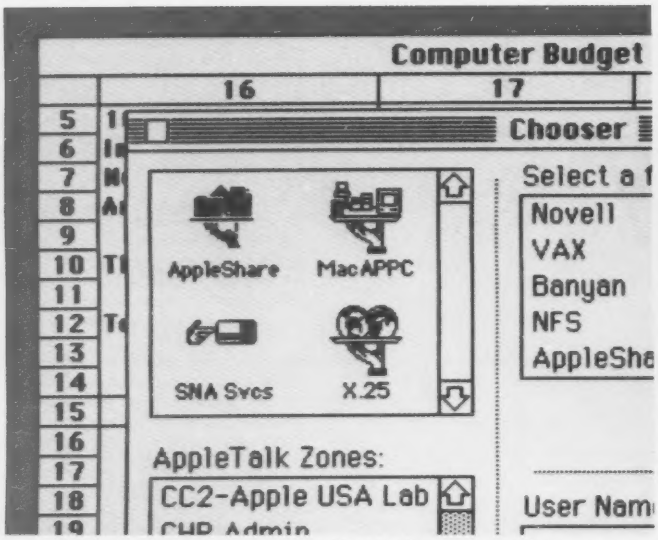

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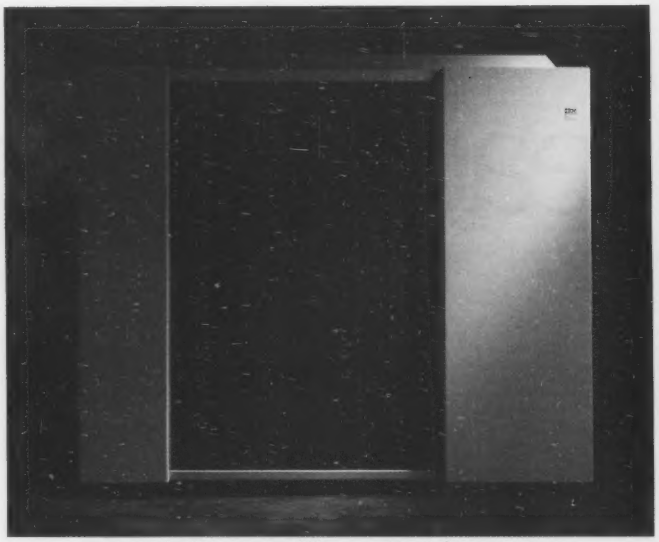

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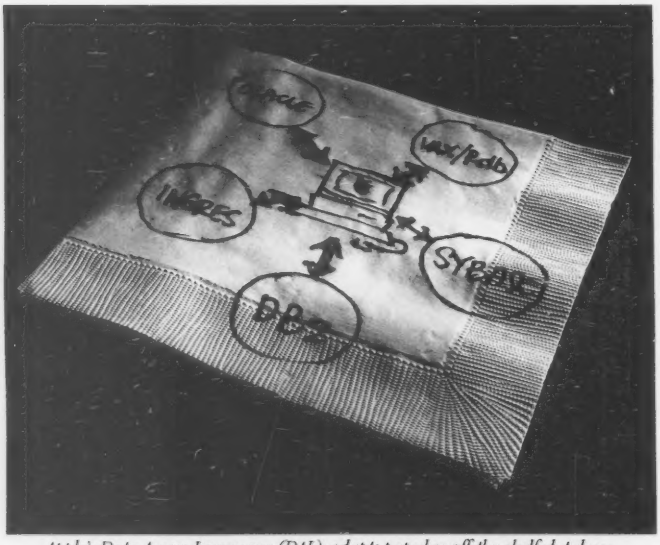

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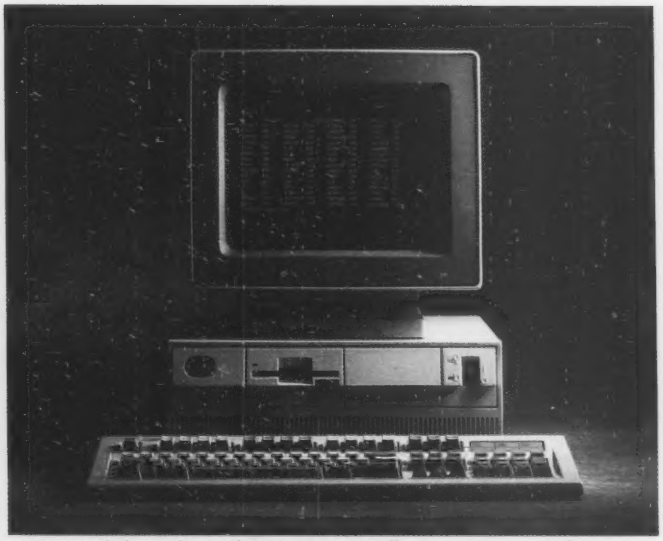
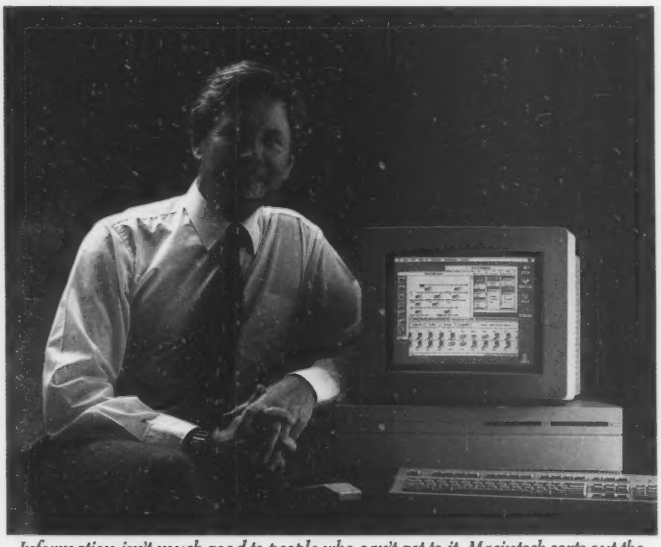
to anything.



Macintosh shares data with DOS PCs via Novell, 3Com, Banyan, and more. Macintosh reads and writes DOS files on a floppy disk. Macintosh runs DOS programs. Maybe your next DOS computer should be a Macintosh.



Information isn't much good to people who can't get to it. Macintosh sorts out the complexities of multiple computer systems and presents vast information to people at the desktop in a single, consistent way.

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While diversity may make life rich and fascinating, it makes life as an IS manager something short of serene.

What is politely referred to as the "multi-vendor environment" is an amalgam of disparate hardware, incompatible operating systems, dissimilar databases, and multiple networks. Nevertheless, IS people are expected to make these all work together in perfect harmony.

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Fibretrunk host link to debut

BY ELISABETH HORWITT
CW STAFF

MAPLE GROVE, Minn. — Targeting users with heavy-duty host data transfer applications, Communications Network Technology Corp. (CNT) plans to announce this week a system that is said to provide two-way, 100M bit/sec. rates for up to 32 channel-based host connections.

CNT's Fibretrunk uses fiber-optic cable to link multiple CNT Channelink channel-based network processors into a single logical unit that supports any-to-any communications among a group of hosts, peripherals and local-area networks, the company said. The system, which can connect up to 64 Channelink processors, allows users to take advantage of recent boosts in throughput rates, CNT spokesman Douglas Anderson said.

The system supports IBM mainframe connections to the following types of systems:

- Another host, for bulk data transfer.
- A high-speed tape drive.
- A 100M bit/sec. Fiber Distributed Data Interface LAN.
- A 45M bit/sec. T3 wide-area network connection.

Support for IBM's Escon is in the works, CNT said.

Fibretrunk supports 100M bit/sec. connections between Channelink processors over distances up to 500 meters and 50M bit/sec. connections at distances up to 1,000 meters, CNT said. The product consists of two components. The Fibretrunk Function Module, priced at $14,000, is a card that sits in the Channelink cabinet to connect it to the Fibretrunk switch. The 16-port switch costs $26,000. Each port can support one Channelink box, or two ports can be allocated to a Channelink box for redundancy purposes, CNT said.

Ports can be added to the Fibretrunk switch in increments of 16, up to a total of 64, at a cost of $20,000 per increment. Multiple hosts, peripherals, LANs and WAN links can be connected to a single Channelink cabinet; however, if too many devices share one Channelink, the box can become a bottleneck, and another box must be added to the switch, Anderson said.

CNT is also expected to introduce Channelspeed, a software product that is said to speed up the throughput of popular bulk file transfer packages, such as Systems Center, Inc.'s Network Datamover, by allowing them to send data over aggregate host channels. Traditionally, such packages are limited to one host channel.

Both products are scheduled for general availability in the second quarter.

Pizza Hut: Imaging, EDI

FROM PAGE 67

updating the accounting package with this information.

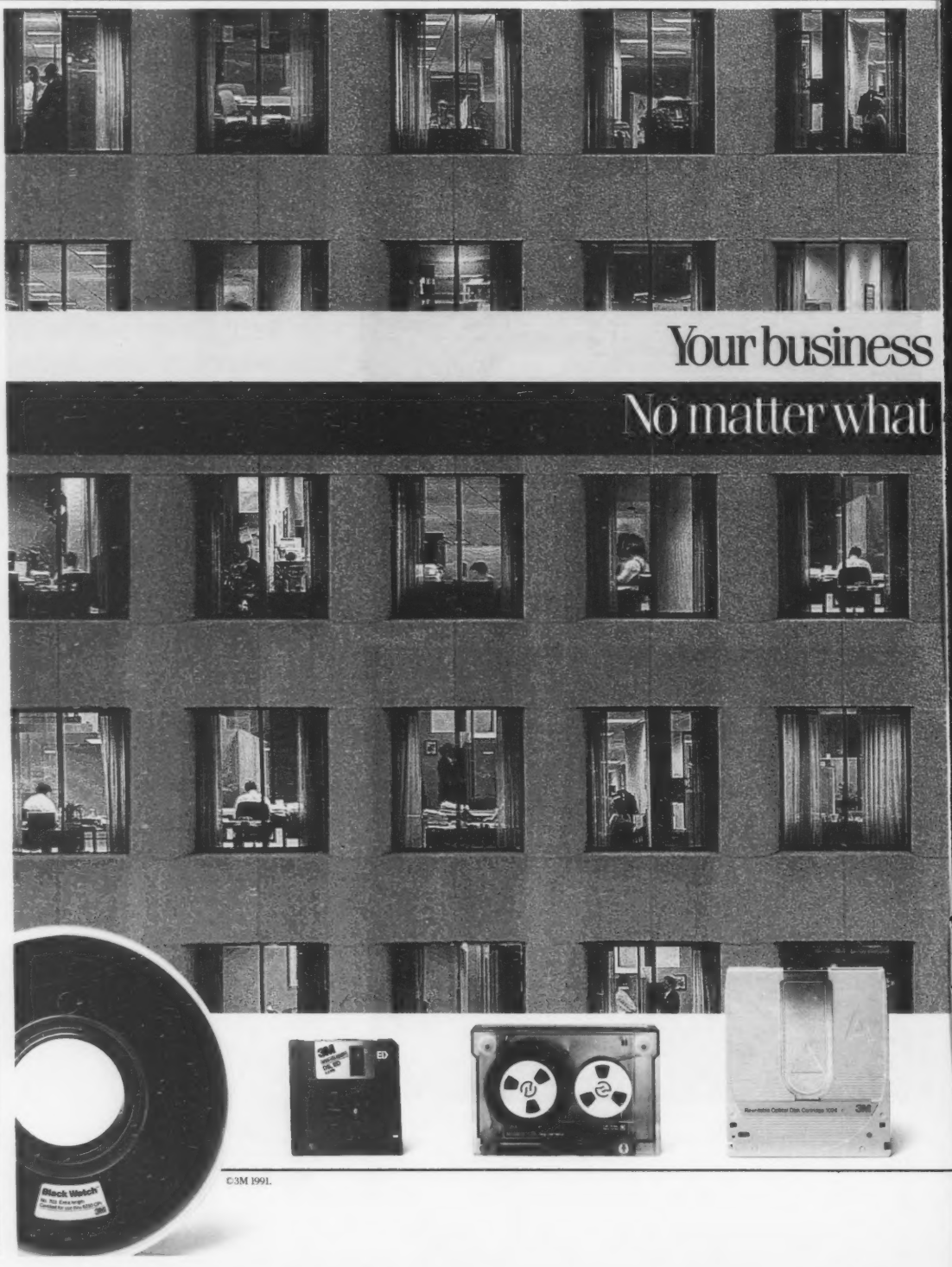
Even more helpful is what the image system does with the incoming invoices, which arrive as faxes that go straight into the image system via a dedicated personal computer that acts as the fax gateway.

Because the sending phone number at the top of the fax is written in ASCII, it can be recognized and used to search against a master database of Pizza Hut suppliers. When a match is found, additional information can be coded and associated with the image of the invoice.

Another 50,000 incoming invoices a month will be captured this way, Landers predicted.

The imaging system went online in November and currently supports 42 users on Filenet clustered workstations. Eventually, the system could have as many as 100 users.

"We're expecting a 25% productivity improvement and a payback in just under three years," Landers said of his $1.6 million investment.



Users give nod to Cisco SNA/LAN blend

BY JOANIE M. WEXLER
CW STAFF

MENLO PARK, Calif. — Cisco Systems, Inc.'s unfolding and shifting strategy to blend IBM Systems Network Architecture (SNA) and local-area network environments is on the right track, according to users and analysts.

Earlier this month, the company rolled out the third step of a year-old, five-phase plan for merging the inherently incongruous environments. Its Phase 3 router software, slated to ship in March, mainly addresses session loss problems that can result from interconnecting SNA over long-distance LAN-to-LAN connections as well as collapsing separate router and SNA backbones into one network.

One user said this is the meat of Cisco's IBM integration strategy for his firm. The introduction of wide-area networks has meant separating LANs by great distances, creating delays in SNA transmission acknowledgments that can result in multiple retransmissions or loss of user sessions, said Dan Simone, network engineer at the land mobile product sector of Motorola, Inc., a Cisco shop in Schaumburg, Ill. In the current system, Simone explained, users logged on to remote hosts "suddenly get no response, as if you just pulled the plug on their terminals."

The upcoming software version will speed up data acknowledgment by doing it at each local router — in addition to remote hosts — and will lighten wide-area traffic loads, users said.

Simone said another Phase 3 feature, which converts Token Ring protocols to Synchronous Data Link Control wide-area protocols, is key because it lets the company merge its worldwide internetwork of 30 Token Rings with its IBM SNA backbone "and eliminate parallel bandwidth."

Victor Duchovni, senior systems analyst at Lehman Brothers, a Cisco user in New York, agreed. "We want a single router that will put both on the same line," he said.

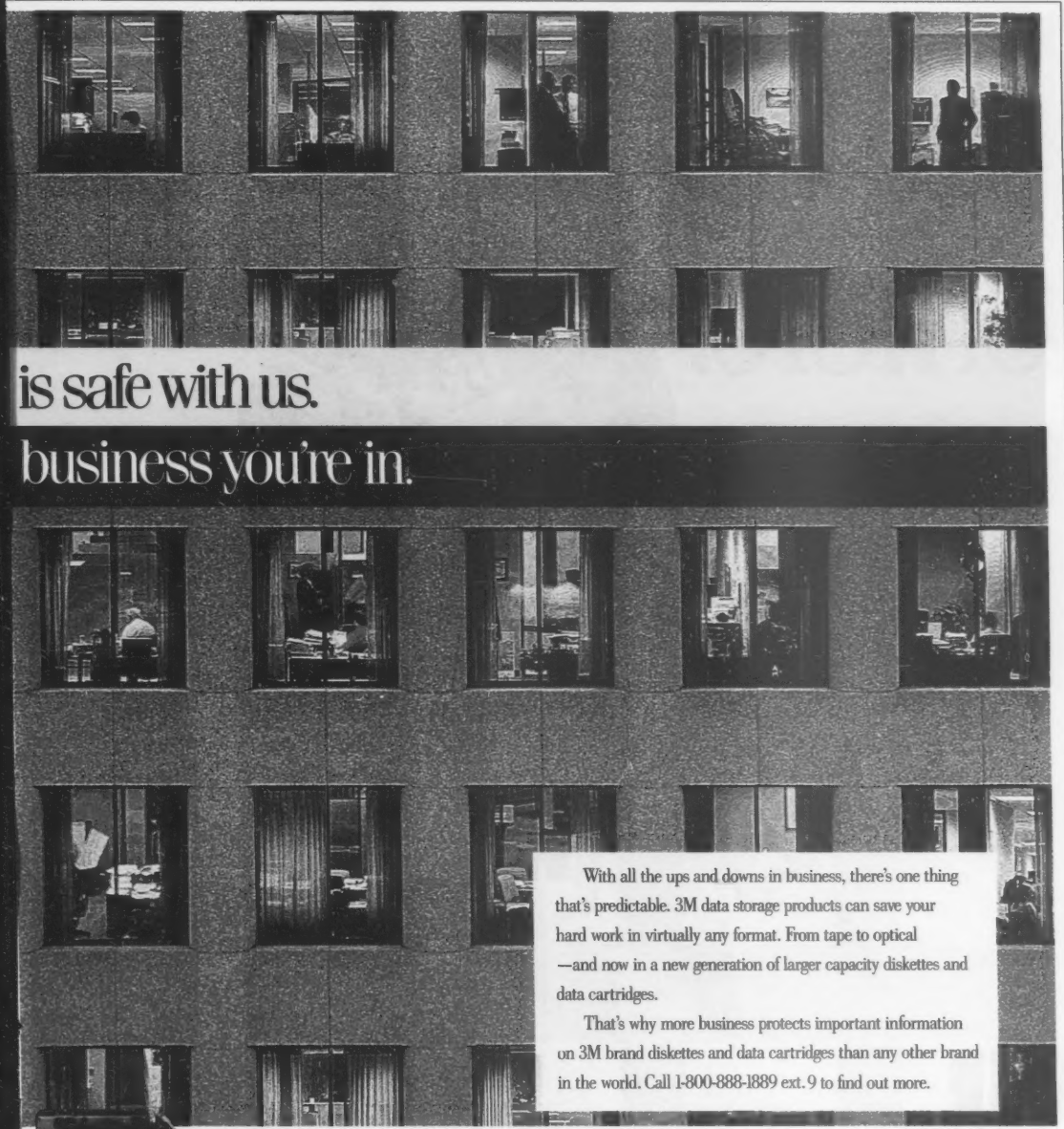
Meets customer demands

Cisco said that based on customer input, it has tweaked its Phase 4 and 5 plans. It has decided to pare its PU4 (front-end processor) emulation strategy in favor of quicker support of Advanced Peer-to-Peer Networking (APPN), IBM's scheme to allow for coordinating resource sharing among SNA devices that communicate directly with each other instead of via a host.

"Frankly, we don't want full PU4 support," Simone said. He explained that complete emulation of a front-end processor by a router would require mainframe personnel for configuration changes. Cisco said it will still incorporate some front-end processor properties into the router. Availability is slated to be announced in the fall.

"PU4 on a router requires an incredible amount of computation for processing a single packet. That exacts a penalty on router performance," said Dave Passmore, a partner at Ernst & Young's Network Strategies Group in Fairfax, Va.

IBM's APPN does not yet address 3270 terminal traffic, though industry observers said they expect IBM to announce basic terminal traffic support for APPN shortly.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MANAGER'S JOURNAL

EXECUTIVE TRACK

Jack Sprague has been named vice president of information and telecommunications systems at **Transkrit Corp.**, a Brewster, N.Y.-based printer of business forms, promotional mailers and labels.

He is responsible for all of Transkrit's computer and telecommunications systems requirements.

Sprague spent 20 years at Nestle USA. His most recent position was corporate vice president of information systems at Nestle Foods Co.

He holds a bachelor's degree from Michigan State University.

.....

Richard F. Morrison, formerly chief information officer at American Express Information Services Corp. (ISC), has been named president of **Call Interactive**, an Omaha-based joint venture of ISC and AT&T.

Call Interactive provides 800- and 900-number interactive voice services to the entertainment, packaged goods, direct response and advertising/marketing industries. It was formed in 1989.

Morrison became CIO at ISC last year. Before that, he was senior executive vice president and co-chief administrative officer at Shearson Lehman Brothers, Inc.'s Information Services Division. He joined a predecessor firm of Shearson Lehman in 1964.

.....

Elise J. Ross has been promoted to senior vice president of systems and technology at **The New York Times**. Ross, 48, had previously been senior vice president of systems. The change is part of a reorganization at the newspaper designed to stimulate marketing and sales.

Who's on the go?

When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor, Management, *Computerworld*, Suite 400, 500 Airport Blvd., Burlingame, Calif. 94010.

Changing the game at Brookstone

Specialty chain dumps mainframe, trims IS staff in a sign of the retail times

BY CHRISTOPHER LINDQUIST
CW STAFF

Tough times call for firm measures, and few industries have it tougher than the U.S. retail business, which just wrapped up its worst sales year in three decades. Gadget and gizmo retailer Brookstone Co. knows this and is making some drastic changes to achieve the goals of efficiency and cost control.

Last week, Brookstone told half of its 20-employee information services staff — mainly programmers — that their services will no longer be needed. That is because Brookstone, a Peterborough, N.H.-based specialty mail-order and retail firm, will be shifting from custom software development to the exclusive use of off-the-shelf packages during the next year.

Brookstone is transferring all retail operations from an IBM 4381 mainframe to an Application System/400, leaving the mainframe to handle only the mail-order sales. This shift is expected to save more than $1 million per year in information systems costs, according to Edward Stanley, director of information services.

"Our whole IS focus is going to be implementation, training and support rather than custom development," Stanley says.

Most of the savings should materialize through reduced personnel and support expenses. The move to the AS/400 is also intended to increase operational efficiency via such means as better inventory control.

Stanley says he wants to reduce Brookstone's IS costs as a percentage of sales to a level equal to or below the industry average of 0.8%. Brookstone currently spends 1.2% of its sales on IS; annual sales are $100 million.

"Being efficient operationally — that's no longer a competitive advantage; that's a necessity," Stanley emphasizes. "It's not a luxury anymore to be anything but a well-oiled machine."

Seth Resnick

Stanley thinks the *break from an IBM 4381 to AS/400 for retail sales will save $1 million a year*

Stanley, who has been at the firm for 11 years, will oversee the largest wholesale change to computer operations at Brookstone since the retailer rented its first computer time from the local Guernsey Cattle Club (see story page 89).

All of this change is a result of a decision made two years ago to totally reorganize the company's computer systems, according to Jeffrey Temple, Brookstone's vice president of finance and systems. Mainframe-based systems that were originally developed to handle the mail-order operation were not up to the task of retail sales, which had gradually become the primary focus of Brookstone's operations.

"What we had was a base system that was crumbling," Stanley says, describing the current systems as having "four or five years' worth of Band-Aids for retailing on top of them."

However, before the new AS/400 could be implemented, an effort at spin control had to be made to buy the company some planning time. As a result, IBM's Data Interpretation System, a graphical front end to DB2, and Comshare, Inc.'s Arthur Planning, a merchandising planning and retail executive information system, were brought in to prop things up. Both packages leveraged a strong point of Brookstone's systems — access to large amounts of detailed

Continued on page 89

80% satisfied with outsourcing, survey says

BY CLINTON WILDER
CW STAFF

The bloom remains very much on the outsourcing rose, according to about 100 companies polled in a recent survey. And it appears that most of the impetus for outsourcing comes from strategic and not strictly cost-cutting motivations.

The 103 Fortune 500 firms surveyed in late 1991 by the Bryn Mawr, Pa.-based Executive Insight Group, Inc. expressed strongly favorable opinions about outsourcing all or part of their information systems function. Of the 60 companies in the survey that have already chosen outsourcing, 80% said they have achieved satisfactory results, and only 7% said their experience had been unsatisfactory.

"The strong feeling [among respondents] was that outsourcing was one more arrow in the quiver, one more tool in the tool kit of IS and definitely worth taking a look at," said Executive Insight President Dudley Cooke. Most survey respondents were the top IS executives at large companies in pharmaceuticals, banking, manufacturing, energy, insurance and other industries.

Cooke: *Outsourcing worth looking at*

A noteworthy 83% disagreed with the statement that IS activities were viewed as nonstrategic by their senior management and therefore likely to be outsourced to save money. "Costs were really not the key factor," said Executive Insight Vice President Jack Schrodel, who coordinated the survey.

One respondent wrote, "We could have a strategic system that a vendor could implement more quickly than we could, therefore accelerating the benefits."

Still, many respondents issued "buyer beware" warnings to those considering outsourcing. Schrodel said the best outsourcing results are achieved when the IS department has optimized its own operation as much as possible, then turns to a vendor for further improvements or needed expertise.

The survey was completed before the recent Electronic Data Systems Corp. lawsuit against Computer Associates International, Inc., but Schrodel noted that many firms that have outsourced said they have experienced difficulties with CA on the transfer of software licenses.

CA's policies "have been one of the biggest obstacles to firms that are trying to outsource. A lot of people are upset with them," he said.

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COMMENTARY

Les Gilliam

Techie jobs less risky?

A lot of people with outstanding technical talent absolutely refuse to consider a management post. On the other hand, there are many highly motivated people who can't wait to become somebody else's boss.

What about those others who have performed well in a technical job but are told their next assignment is a supervisory position? Is the change from a technical to a management career always the best choice? Can you ever go back?

The following stories are true. The names have been changed out of consideration for those who have already suffered enough humiliation.

▶ Jack was an outstanding systems programmer and soon became the leader of the group. Wanting to advance, he accepted more and more responsibility until he found himself in the corner office with the title "IS manager" on the door.

When his company acquired another firm, he moved his family to a distant city to complete the merging of the two computer groups. He was promoted to vice president and headed a multifunction organization.

Then came the day he was told the company had decided to thin its management ranks and that his position could be eliminated. Ironically, this was possible because he had recruited and developed outstanding leaders in his various areas of responsibility.

▶ Joe was a top-notch applications programmer who moved to analyst, project leader and eventually applications manager. Because of his outstanding leadership skills, he was promoted to data center manager.

His company was acquired by a firm that had its own data centers. When it was announced that outsourcing was to be considered, Joe suggested merging the data centers. He headed the study that resulted in his idea being adopted. But then the ax fell. The data centers were to be merged, but he would not be the manager. His position was eliminated.

▶ John was an outstanding accountant who became the assistant financial manager of the company. With this position came the responsibility for supervising the computer group. But when times got tough, the company decided his was a position that could be eliminated.

In all three cases, these managers had been outstanding technical employees but accepted management assignments. When their positions were eliminated, they were not given the choice of a demotion or returning to a technical position. They soon discovered that their ages (late 40s/early 50s), salary level and management experience were liabilities in finding other jobs.

Even worse, the break in service between companies will cost them in retirement benefits because the primary factor in the retirement formula is continuous years of service.

Jack has since found a job, hired by a friend at another company but at two levels lower than his prior position. Joe and John are still searching.

Should successful technical employees aspire to management? How often do they have a choice? If they refuse the management assignment, are they threatened with limited advancement?

Experienced technical people who maintain their knowledge and skills are always more marketable than those with only management skills to offer. Granted, managers tend to earn higher salaries than technicians when they are working, but to be let go after many years of service can bring devastating financial and emotional results.

Weighing rewards

Career changes should be considered with your eyes open, so to speak. Are the rewards worth the risk? Are you accepting a switch to management because your interest and talent make it a wise move or because some boss has decided it suits his own purposes?

The rewards of moving into management usually include higher pay, more influence, greater responsibility and increased recognition. But with these rewards come much greater risks, such as personnel problems, dependency on subordinates for success, loss of technical expertise and portability, exposure to reorganizations and management change and being viewed as noncritical to the success of the business.

In today's economy, mergers, consolidations and outsourcing have made management jobs in IS riskier than ever before. In many big outsourcing deals, those in technical positions at least have the option of going to work for the outsourcing vendor. Those in management positions are often more expendable.

Let the employee beware. There are no guarantees of a job for life, no matter how outstanding the performance or how faithful the service. Every payday the company settles the account, and the cycle starts over — with no assurance beyond today.

Gilliam is president of Gilliam Associates, a computer management consulting firm based in Ponca City, Okla.

EXTEND THE REACH OF YOUR LAN WITH CD ROM

This is the information age. The power of information is in its accessibility. Your net-work represents a major investment to get information into the hands of the people who need it. It's also an investment in shared resources. CD ROMs have given computer users access to more information at lower cost than any other medium. Now, Meridian Data's CD Net® extends the reach of your LAN by placing that information on the desk of everyone on your network.

INFORMATION ACCESS THAT GROWS WITH YOUR NEEDS

CD Net offers you an upgrade path with three versions of its networking solution. Start with CD Net Software. Move to an entry level, 8-drive CD Net 100NC integrated hardware and software system. Add the power of a sophisticated CD Net 314, 14-drive server for demanding, high traffic environments or a Model 428, 28-drive system, for enterprise-wide access.

UNLIMITED ACCESS TO INFORMATION

There's virtually no limit to the number of CD Nets (and CD ROMs) that can be merged into your network. Each CD Net 428 provides 18.4 *gigabytes* of incremental information.

WE WROTE THE BOOK ON CD ROM NETWORKING

Meridian offered the first CD ROM networking product over three years ago. It's no coincidence that more organizations depend on Meridian Data's CD Net than any other product.

WHAT INFORMATION DO YOU NEED?

There are over 2500 information sets available on CD ROM today and the number is doubling every year. *You can even publish your own internal information on CD ROM with the help of Meridian's publishing systems.*

FREE LISTING OF CD ROM TITLES!!

Call Meridian and receive a free sample listing of the kinds of information you will find available today on CD ROM.

CD NET UNMATCHED ADVANTAGES

- Netware™ 286 and 386, Banyan® VINES™, AT&T, LAN Manager®, LANtastic®, 3Com®, IBM PC LAN® support.
- Microsoft® Windows™ 3.0 compatibility.
- Ethernet™, ARCNET™, and TokenRing™ support.
- Sophisticated data caching for fast access.
- Easy administration with a menu system that organizes and controls access to all discs on the network.
- Proven Quality, Service and Support from Meridian Data.

AVAILABILITY

CD Net is available from distributors, VARs, and system integrators. Call Meridian and ask for the CD Net Department and the nearest reseller.

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Scotts Valley, CA 95066
Phone: 408-438-3100
FAX: 408-438-6816

European Headquarters
Phone: 31-40-863082
FAX: 31-40-859455

PC MAGAZINE EDITORS' CHOICE
December 31, 1991
CD Net, Version 4.11

BANYAN™

Novell NetWare Aware

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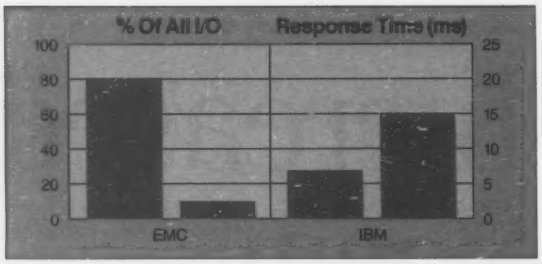
Symmetrix.
When We Increased
The Capacity--
While Retaining Our
Small Footprint And
Industry Leading
Performance--We
Got A Very Gracious
Response From Our
Competitors.

They're Behind

For more than a year, EMC's Symmetrix Integrated Cached Disk Array (ICDA™) has lead the industry in virtually every significant disk category: first in



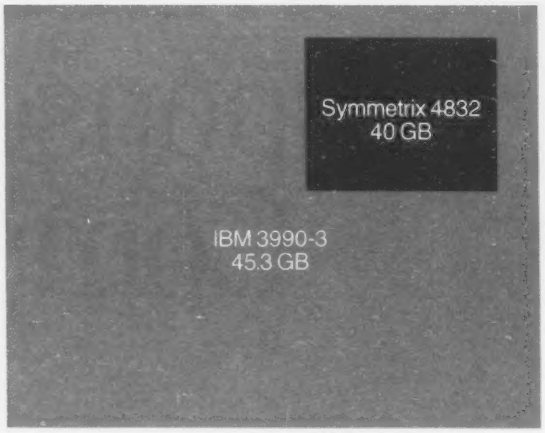
performance; first in capacity per square foot; first in environmentals and cost of ownership; and first in data availability. While our competitors have talked about developing a solution like Symmetrix, EMC has delivered it. And now we are introducing the expanded capacity and functionality of the Symmetrix Series.

Expanded Capacity In The Same 5.5 Square Foot Package.

The Symmetrix 48XX Series is a powerful new storage platform that provides up to 40 GB of disk capacity, 3 GB of cache, disk mirroring, hardware redundancy, and a full-system battery back-up, all in a 5.5 sq. ft. package. The platform allows for field upgrades, which over time can bring it to 60 GB and beyond, that's more than double our original configuration. And it ensures that the Symmetrix Series will offer continued improvements in economy, data availability... and flat-out speed.

A Footprint That Can Fly.

Symmetrix now may be configured with up to 32 volumes of 5.25" disk drives, each with a device level buffer for faster transfers and 100% write caching. To eliminate rotational delays, Symmetrix incorporates up to 3 GB of cache—more than 40 times the cache of conventional cached DASD. This, combined with EMC's proprietary caching algorithms, have produced performance gains well in excess of 40% for Symmetrix users, whether they run a 4381 or multiple ES 9000 systems.



Put Conventional DASD Behind You.

Announcing the Symmetrix 48XX Series:

- Up to 40 GB Disk
- Up to 3 GB Cache
- Mirroring Option
- Full System Battery Back-up
- All in 5.5 sq. ft.

For more information send in this card or fax it to: 508-435-6560

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Company _____

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Installed CPU's _____

Installed DASD _____

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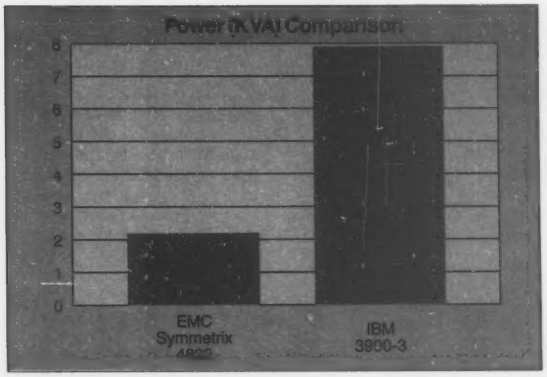
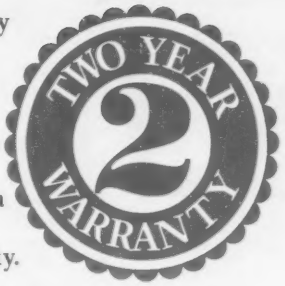
More Data Available More Of The Time.

Since its inception the Symmetrix Series has offered a breadth of features that increase data availability substantially. These include full system battery back-up, proactive on-board diagnostics, Auto-Call service to EMC's Remote Support Center, and a disk mirroring option within the subsystem itself. All this without the need for host intervention. And now, the 48XX Series brings you the added capability of Dynamic Sparing, to further ensure that your data is available when you need it. Every aspect of Symmetrix was designed and built to ensure that the high reliability you purchase will stay that way.



Which is precisely why Symmetrix is the only mainframe disk subsystem that comes with a full two-year warranty.



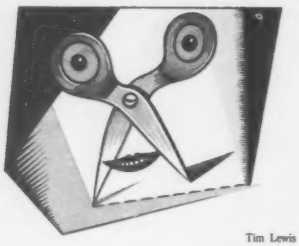
Symmetrix Beats The Others Coming, Going and Growing.

Symmetrix is easy to install, faster in operation and runs at a lower cost of ownership than any disk solution available. More important, Symmetrix isn't just a promise or an idea on a drawing board. It's here today, delivering proven performance, savings, reliability–and now, a new series that's second to none. Many customers are already enjoying the benefits of the Symmetrix Series. If you would like references or product literature, please call EMC at 1-800-222-EMC2 ext. L183C (in MA call 508-435-1000, in Canada call 1-800-543-4782).

Us All The Way.

EMC²

CLIPS



Tim Lewis

Summaries from leading scientific and management journals

"Implementing Client/Server Systems"

By David Freedman

Computerland Magazine
January/February 1992

■ Companies looking to the client/server model for system flexibility, broadly accessible information and reduced operating costs are likely to achieve all three, if the process is well-planned and carefully executed.

There are seven basic issues that should be addressed to smooth the transition to client/server:

1. Planning: A task force of information systems and non-IS managers should interview end users, set standards and institute pilot programs.

2. Compatibility: Client/server "standards" are not necessarily uniform, so some front-end querying tools will not work with some back-end database servers. Standardizing on front-end and back-end software from one vendor can solve the problem for some companies.

3. Rollout strategy: Introduce the new architecture in pieces or by work groups.

4. Support: Full-time network-proficient personnel are a necessity, with centralized support functions suggested.

5. Budgeting: Expect that personnel and specialized outside service costs will be a large part of the investment. Savings on hardware may wind up being spent on software and personnel.

6. Gains: Productivity is expected but may not happen as quickly as anticipated. Many client/server users will be new users with little experience in technology.

7. Jobs redefined: End users accessing more data means workers can do things differently and can do different things. — *Alan J. Ryan*

"The Standards"

By Scott Wallace

Inform
January 1992

■ Standardized health care systems may be just what the doctor ordered. Standardization would help health care providers get the most for their money, but progress has been slowed by rising costs, reduced resources and the diversity of the electronic imaging systems typically found in medical environments.

The American College of Radiology and the National Electrical Manufacturers Association have been working together to develop a standard for interconnecting medical imaging equipment that would meet the needs of the medical community.

The criteria is that newly acquired data should be transferable to central viewing locations; patient information that is clinically relevant should be accessible from these locations; transfer of images and data should take place without corrupting the data; information should be simultaneously accessible from more than one site; and it should not be difficult to add equipment to a communications group.

To provide a forum for the exchange of information regarding standards development for health care IS, a consortium called the Healthcare Information Standards Coordinating Committee has been formed.

Its goal is to collaborate with national groups to isolate a set of operational standards that support the breadth of health care computing requirements. — *Kelly E. Dwyer*

"Information Systems and Transborder Data Flow"

By Elaine Waples and Daniel M. Norris

Journal of Systems Management
January 1992

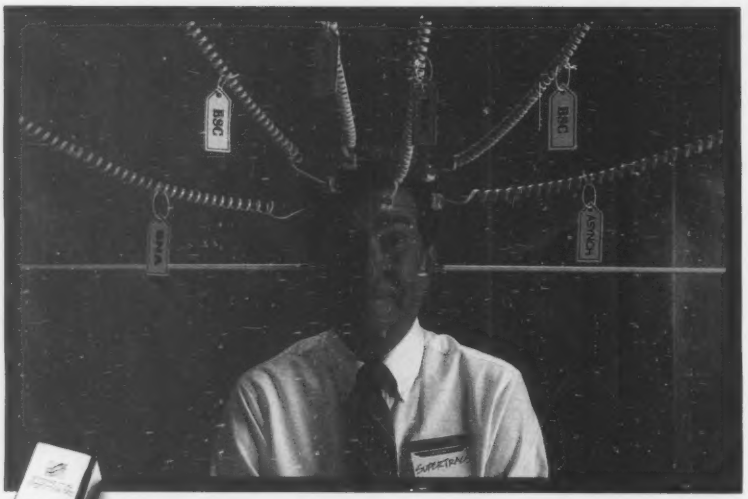
■ Global information systems pose more than a technical challenge alone. For systems controllers and auditors — whose jobs will expand as companies become global — these systems also represent the political, economic and cultural factors of more than one country.

The primary area of concern for global IS is transborder data flow. Many countries place restrictions on the flow of information across their borders for privacy protection, economic issues and national sovereignty considerations.

Economic regulations imposed by various countries can decrease data timeliness and reduce economies of scale allowed by centralized processing.

Also, some developing countries fear becoming technologically dependent on other countries so they impose obstacles to data transmission to multinational companies. — *Alan J. Ryan*

MEET THE DATA TRANSFER MANAGER YOU'LL HIRE SIMPLY BECAUSE OF HIS CONNECTIONS.



Meet the data transfer software that communicates with any system.

It's called SUPERTRACS.

And for banks, retailers – anyone with heavy electronic data transfer demands – there's no better way to handle EDI, polling, ACH, payroll, direct deposit and other transmission needs.

For system-independent transfer of data, SUPERTRACS supports SNA, BISYNCH and ASYNCH protocols. It's also totally automated for unattended, concurrent transmission and collection of batch data between the host mainframe and remote computers.

SUPERTRACS operates like an electronic mailbox, so data can be stored for later transmission, or received and stored for later extraction – all automatically. Remote sites can also be granted access to data during predetermined windows.

SUPERTRACS even supports the outboarding of ASYNCH and BISYNCH connections to a PS/2 for a pure-SNA host environment.

In short, SUPERTRACS is the one communications package that can handle everything you throw at it. And the only package that can totally automate your electronic data transfers.

SUPERTRACS: Data transfer software with support for SNA, BISYNCH and ASYNCH, even in pure SNA-host environments. Handles simultaneous, automated collection and transmission of data on multiple lines.

TRACS: The industry standard for drop-in single session SNA/BISYNCH batch data communications.

PC-TRACS: A set of PC-based products to handle micro-to-mainframe communications – quickly and automatically.

Isn't it time to automate your data transfer? Just connect with Sterling Software by calling (916) 635-5535.

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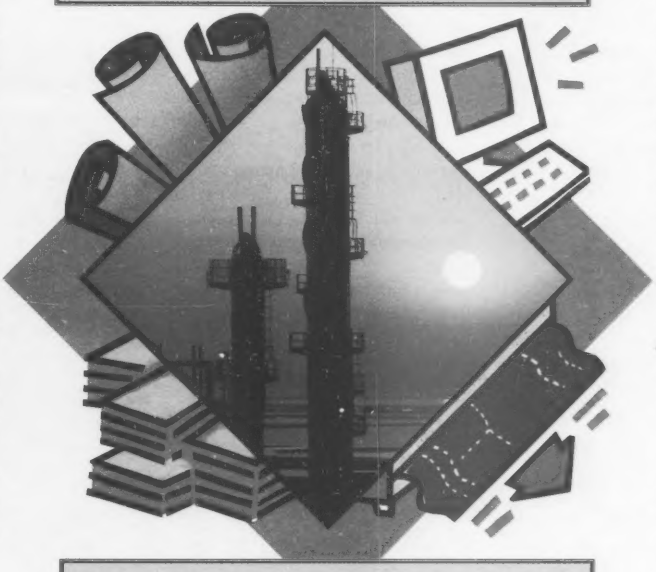
DIGITAL UPDATE

THE OPEN ADVANTAGE JANUARY 1992

DOCUMENTING THE CHALLENGE IN TODAY'S MANUFACTURING ENVIRONMENT

Engineering documents are the lifeblood of a manufacturer. And there are literally hundreds of thousands of documents inside every plant. Operating instructions, performance data, project plans, manufacturing safety data sheets, heat and material balances, engineering drawings, regulatory specifications. And the list goes on.

Manufacturers are working hard to overcome a host of problems associated with managing this myriad of documents: security issues, timely access, tracking who's updating which version of what document. All the while facing new government standards for auditability and ease of access to all plant documents.



New Requirements, New Demands

The large number of interdependent engineering documents needed to operate and maintain a manufacturing plant can no longer be scattered between various libraries, file cabinets, desk drawers, and engineering vaults. Emerging regulatory requirements and quality issues have resulted in an unprecedented need for controlled and timely access to these critical documents, including underground piping layouts, electrical schematics, process hazards analysis, operating procedures, emergency shutdown procedures, and policy manuals.

In the petrochemical industry, for example, companies are under increasing pressure to meet stringent new safety regulations and emergency response guidelines, or face multimillion-dollar fines. Compliance often means providing an accurate audit trail of equipment and piping changes — from how the plant was built to its current state — as well as being able to trace accountability and provide detailed reports.

As another example, more than thirty countries have adopted the ISO 9000 initiative and its related standards for manufacturing and engineering quality. Vendors that fail to satisfy these requirements risk having their products shunned by companies whose own customers will require evidence of certification. Compliance requires documented design reviews, design modifications and verifications, and approvals.

Traditional Document Management Approaches Are Obsolete

It's clear why accurate tracking of changes in complex engineering documentation is now a business necessity. Yet control is complicated. Today's manufacturing plant typically stores over one million documents, with an expected increase of 20 percent per year — far more than manual systems can handle.

Ironically, the proliferation of new technologies that automated many manual systems has also created daunting challenges. The introduction of computer-based tools, such as CAD and word processing workstations, has resulted in engineering drawings that exist as paper drawings, computer-plotted mylars, vector files distributed on workstations, and even optical disk files storing raster images. Supporting documentation exists as online word processing files and spreadsheets, handwritten notations, preprinted forms, and voluminous procedure manuals.

The scenario is further complicated because any one of these documents may be included in numerous document sets. Updates initiate cascading updates across the plant. If, for example, an engineer redesigns a piping configuration to allow added manufacturing flexibility, that change must be noted on all the supporting documents.

Frequently, however, the document has been copied several times and updated by different departments without coordination. The result is users not knowing which copy is the most current, and managers unable to audit and control documents. Information cannot be retrieved fast enough to meet decision-making timeframes.

Creating an Integrated Engineering Document Environment

Thanks to recent advances in the information technology marketplace, manufacturers can now adopt a strategic approach to building an integrated engineering document management system (EDMS) that will go a long way toward meeting the information needs of a plant or process engineering organization.

The most effective EDMS plan is based on a four-step approach:

- First, the strategy must support various accessing schemes throughout the corporation. The system should incorporate all forms of engineering, design, and text documents in a relational database. Retrieval should be easy to use, provide fast access, and require little training. And it must be flexible, to accommodate the uncertainty of future regulatory reporting requirements and the evolving needs of a variety of users. For example, some users may choose to search for documents by name or class, while others prefer to search by keywords or closest-match (known as fuzzy search).
- The engineering document management system must provide a broad range of security devices to protect against unauthorized access, minimize document loss and, most important, ensure that the documentation stays up-to-date.
- The engineering document management system must also provide archived files that record the history of all changes made to the documents. This audit trail is key to demonstrating regulatory compliance.
- Equally important is the ability to integrate the document management system with other enterprise-wide systems, which are likely running on a variety of PCs, workstations, and mainframes. As technologies evolve and the needs of a corporation develop over time, the engineering document management strategy must accommodate these emerging technologies while preserving existing system investments.

Read on for details on the FREE DECedms Challenge.

Digital's Solution for Engineering Document Management: DECedms

It's the only commercially available EDMS product specifically for process manufacturers. And you helped design it.

Developed with the guidance of our own process customers to meet their specific needs, DECedms embraces the philosophy that document management systems should not be standalone islands, but rather integrated with and integral to the safe and productive operations of a process plant.

DECedms Does It All

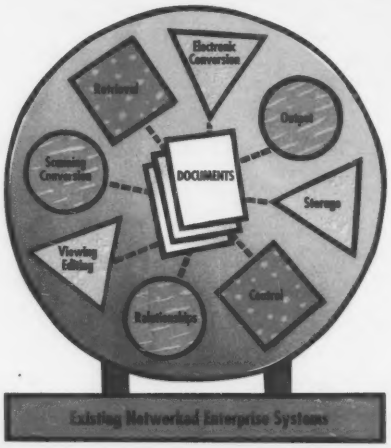
DECedms provides complete control over a plant's engineering documents and related information — from the moment documents are created through archival storage at the end of a project. It combines the powerful document management capabilities of EA Systems Inc.'s Re:Solution product with the unique retrieval and indexing capabilities available with Excalibur Technologies' Savvy/TRS. The result is a client/server-based document management system scalable from small to global levels.

With DECedms, you have access to the most accurate information because you are always aware of changes that are in process. When a change is made to one document, DECedms deals with the design change dependencies and facilitates updating of all documents affected by the change. The system also provides archived files that record the history of all changes.

While various available technologies address parts of the plant document problem, DECedms is unique in managing and controlling all plant document types, regardless of their original format — from engineering drawings to office documents, from online forms to CAD drawings, from text drafts to handwritten manuals, scanned, converted, or input directly.

Once you've stored documents, you can retrieve them in a quick, flexible way — using requests based on a keyword, file name, or closest-match clue. Indexing smartly includes complete cross-referencing.

Documents can be easily distributed on existing desktop devices within your network. And, because it is a standards-based solution, incorporating Digital's Network Application Support (NAS) products, DECedms also allows you to link into additional operational systems, including environmental health and safety, manufacturing management, process engineering, and other core databases across the enterprise.



You Challenge Us:
Put DECedms to the Test

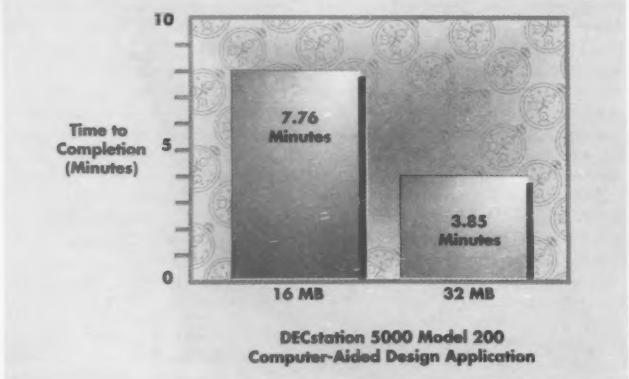
Perhaps your engineering department is working on a new expansion or process upgrade project. Whatever the project, we invite you to send us a copy of a marked-up engineering drawing. For the first 100 drawings received by March 31, 1992, we'll send you back a disk for your display platform of choice — PC, Macintosh, or VAXstation. The disk will contain a scanned-in version of your drawing and Re:View software, a DECedms component that will give you online access to changes made to your engineering drawing.

For offer guidelines and other details, call 800-DEC-INFO (800-332-4636), ext. EDMS.

Save with Memory Options

Save Time

More memory means more performance — and that means your system could get twice as much work done. For example, as shown below, a Mechanical Computer-Aided Design application runs two times faster on a DECstation 5000 Model 200 — just by increasing memory from 16 MB to 32 MB.



DECstation 5000 Model 200
Computer-Aided Design Application

Save Money

With price cuts of up to 50 percent, now is the time to see how more memory can bring more power to your workstation — often doubling or tripling its speed — at prices you can't afford to ignore. Here's a sample of how much you can save:

DECstation 5000 Model 200
DECsystem 5000 Model 200
32 MB Memory
Order # MS02-CA/AGH
Now $7,040 SAVE 45%!

DECsystem 5100
32 MB Memory
Order # MS44-DA/AGH
Now $8,000 SAVE 50%!

Other Advantages Add Up Too

Because Digital memory products are designed for Digital system architectures, you're assured the highest levels of performance and reliability. Nonetheless, our memory products are automatically covered under your existing service agreement. So there's no extra charge. Our award-winning service organization has got you covered, around the clock and around the globe.

For answers to any questions on our memory products, contact your local Digital representative or authorized Digital distributor. Or, to place your order via DECdirect, call 800-DIGITAL (800-344-4825) and reference code AGH.

THE TIME IS RIGHT

for Value-Added Consulting Services

Time is increasingly the most important ingredient to competitiveness and return on investment. As you deal with the challenges posed by the ongoing integration of people, business, and technology, Digital Consulting Services can help you compress the amount of time required to go from identifying a need to implementing a solution. But, you may wonder, why ask a computer vendor to consult with you?

Experience Counts

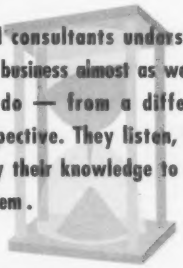
The value that Digital brings to the consulting field stems from the knowledge we've gained from our 35 years of experience designing, developing, and implementing hardware and software solutions. This positions us quite differently from a company whose only business is consulting services or systems integration.

Our experience qualifies us to transfer and apply our knowledge to your business. Whether it's re-engineering a business process, helping work the human elements of change, implementing an application around a vertical industry, or helping with a technology that augments your in-house talents, as we consult with you, we can help you achieve the desired results in less time. We can do this for you because we've already done it for ourselves.

Keep in mind that Digital is now in the solutions business — and that includes service and support as well as hardware and software sales. Consulting is often a necessary element in the solution we provide for a fee — and very much a part of added value Digital brings to the table.

Consulting Services are part of our commitment to providing Open Services in support of Open Systems. Our Consulting Services team includes more than 4,000 people worldwide. And that's not counting our access to experts in other organizations across Digital, such as engineering, manufacturing software development, information systems, and finance. Plus, we have strategic alliances with companies outside Digital whose knowledge skills complement our own.

Good consultants understand your business almost as well as you do — from a different perspective. They listen, then apply their knowledge to your problem.



Success Speaks for Itself

We have successfully undertaken consulting projects with a variety of customers across multiple technologies and industries, including office systems, electronic publishing, business systems, manufacturing and process industries, telecommunications, healthcare, and financial services.

For example, Digital recently completed a workforce change management consulting project with a worldwide agricultural chemical company. An established Digital customer, this company needed to rethink its new product production techniques, while at the same time complying with new U.S. Environmental Protection Agency regulations. Digital Consulting Services was invited to assist in assessing where and how to start a streamlining process. Our initial study recommended that streamlining begin with the R&D regulatory process, followed by a phased implementation. Now, the results are in:

- Improvements in business practices resulted in significant reduction in report preparation time; one report was reduced from one and one-half weeks to two days, another from eight weeks to five weeks. Overall, two months were cut from the production cycle time due to procedural changes, such as instigating joint or concurrent ownership of project phases as well as motivation to get the work done right the first time.
- Scientists' productivity doubled, as reports were reworked fewer times and less-technical components of the process were off-loaded to other staff members.
- Financial benefits are bringing an impressive payoff. After an outside investment of $500,000, 240 percent return-on-investment was realized initially, with 400 percent return-on-investment expected over the lifetime of the project.*

*Based on information from an October 1991 Workforce Change Management Case Study, INDUSTRY SERVICE, published by Gartner Group, Inc.

RESULTS *not* Reports

Digital Consulting Services Program Overview

Some consultants may feel the job is done once they've presented you with a stack of reports and recommendations. Not so with Digital. Our Consulting Services are designed to provide all facets of your business with real solutions and measurable results. Here's a sample of the broad range of programs we currently offer — and all can be tailored to meet your specific needs:

- **Management Consulting**
  - Strategic planning
  - Business and organization design
  - Change management
  - Education planning
- **Information Systems Consulting**
  - Distributed systems architecture planning in a multivendor environment
  - Computer-aided software engineering (CASE) environment design and implementation
  - Systems and network security review and implementation
  - Capacity planning
  - Network management and performance analysis
- **Applications Consulting**
  - Electronic document interchange (EDI) planning, design and implementation
  - DECwindows application development
  - Business application analysis, design, and selection
- **Technology Consulting**
  - Database design, implementation, and system performance review
  - Networks and telecommunications planning and design
  - Transaction processing systems design and implementation

For more information on Digital Consulting Services, contact your Digital Sales representative.

NEWS FLASH

World Tour '92 in Full Swing

After a successful November kickoff, World Tour '92 is now traveling across the U.S., bringing you the opportunity to see Digital's Open Advantage in action.

In a fast-moving, single-day program, you'll learn about successful open computing business solutions being implemented by our customers across a wide variety of industries — aerospace, banking, education, healthcare, manufacturing, pharmaceutical, small business, and retail. Highlights include live demonstrations of our latest products, discussions with industry experts, technology reviews, and video presentations of case studies.

If you need to plan, design, implement, or manage complicated computing environments, World Tour '92 is for you. For more information, contact your local Digital sales representative or call Sue Skonetski at 603-884-3022.

World Tour '92 Upcoming Stops
2/04 Orlando FL
2/11 Houston TX
2/18 Detroit MI
2/25 Anaheim CA
2/27 Santa Clara CA

Digital Openly Supports Sun Systems

If you've got Sun systems, here's some news you could use: Digital now repairs Sun systems — at competitive prices.

In fact, we repair 300 Sun products — from a mouse to SPARC 4, the latest in Sun CPU technology. Turnaround time for repairs is five days, and all repairs have a 90-day warranty. Plus, your Sun products are supportable under the DECmailer and DASP shared maintenance agreement.

Here's a sample of our competitive prices for Sun systems repairs:

Order #	Product	Price
501-1164	SUN CPU Board, 3/75, 3/1XX	$417
501-1381	SUN 4/400 CPU PCB	$3,317
501-1512	SUN CPU, 4/1XX	$1,700
501-1513	SUN CPU Board, 4/1XX	$1,931

For information about Digital's service and support for Sun systems, call 800-225-5385.

Sun Spare Parts Too

If you maintain your own Sun systems, Digital offers more than 300 competitively priced spare parts. Spare parts for Sun systems are easy to order through our normal ordering channels. All require a 14-day lead-time and come with a 90-day warranty.

For information about ordering Sun spare parts, call 800-DIGITAL (800-344-4825) and ask for Part Number Assistance.

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ADVANTAGE-NETWORKS

Brings You Coexistence, Integration, and Choice with OSI, TCP/IP, and DECnet Protocols

Trying to build a network in today's multivendor computing environment can work one of two ways: You force fit your network into your vendor's product design. Or your vendor's products are open and flexible enough to fit your network.

Digital offers you the open, flexible choice. Our ADVANTAGE-NETWORKS family of products is designed to streamline the coexistence and the integration of OSI, TCP/IP, and DECnet protocols — letting you build in varying degrees of interoperability when and where needed.

ADVANTAGE-NETWORKS and OSI

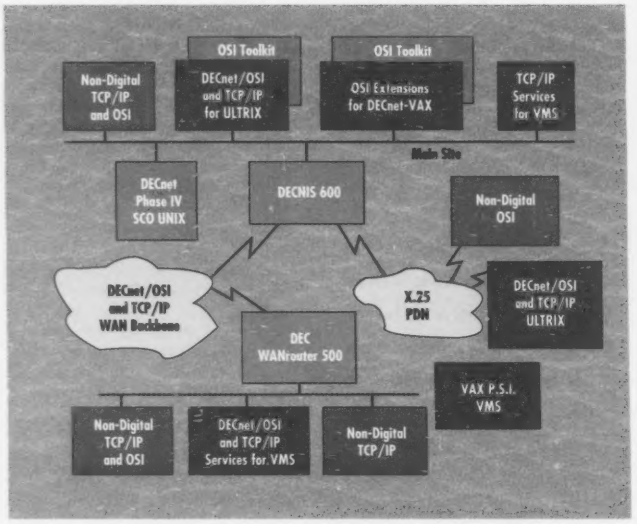
Since 1986, Digital has offered OSI-based capabilities for local and wide area networks. The OSI-based products we offer today include:

- DECnet/OSI for ULTRIX, providing an extensive range of integrated OSI features and functions for ULTRIX systems
- Extensions for DECnet-VAX, a seven-layer OSI protocol stack for VMS systems, soon to be followed by DECnet/OSI for VMS
- OSI Programmer's Toolkits for ULTRIX and VMS
- A full family of multiprotocol routers
- Message Router X.400 Gateway for electronic messaging
- DEC/EDI for electronic document interchange
- DEC OSI manufacturing network interconnect for Manufacturing Message Specifications
- 802.3-based communications products for local area networking.

ADVANTAGE NETWORKS and TCP/IP

For over a decade, TCP/IP has enabled computer systems with many different operating systems to communicate. It is the predominant protocol in the Internet, a worldwide interconnection of thousands of networks, and it is the de facto standard for networking UNIX systems. Digital is committed to providing the same level of investment protection for TCP/IP as with OSI and DECnet. To this end, our ADVANTAGE-NETWORKS line of products includes:

- TCP/IP bundled with the ULTRIX operating system, providing the same TCP/IP protocols as Berkeley BSD4.3 UNIX; NFS (Network File System) is also incorporated for transparent file sharing
- DEC TCP/IP Services for VMS, a layered software product that provides TCP/IP and NFS (Network File System) for VMS systems
- PATHWORKS software, allowing PCs to integrate with ULTRIX or VMS systems via TCP/IP or DECnet
- DECserver 300, combining TCP/IP and TELENET functionality with an enhanced version of LAT software
- A full family of multiprotocol routers
- WAN Device Drivers with the ability to pass OSI, TCP/IP, or DECnet over synchronous links.



ADVANTAGE-NETWORKS opens your networking environment, allowing OSI, TCP/IP, and DECnet to not only coexist but integrate smoothly with one another.

ADVANTAGE-NETWORKS and DECnet

With a 16-year track record and more than 968,000 active implementations, DECnet continues to provide a leading method for peer-to-peer networking. As you know, DECnet is supported on virtually every Digital platform, as well as on MS-DOS, OS/2, Apple Macintosh, and SCO UNIX.

To preserve your investment in DECnet, the ADVANTAGE-NETWORKS family provides complete compatibility between DECnet Phase IV and DECnet/OSI. All Phase IV systems, applications, and network components continue to function in a DECnet/OSI environment. DECnet/OSI allows 64,000 DECnet Phase IV common addresses to coexist in an OSI network.

A broad range of options lets you set the pace of transition from a DECnet Phase IV network to an OSI network — so you can transition end-systems, DECnet areas, and backbone routers at any time, in any order.

The Advantages Are Built In

The ADVANTAGE-NETWORKS family gives you the ability to build a single multivendor network utility to connect all users, so that no system remains an island unto itself. And you reap the benefits of working in a truly open computing environment:

- From a cost standpoint, standard and de facto standard networking protocols are the core of the ADVANTAGE-NETWORKS family. For ULTRIX-based systems, OSI, TCP/IP, and DECnet are licensed with the system. For VMS-based systems, OSI and DECnet are licensed with the system and TCP/IP is offered as a layered product that includes a Network File System (NFS) Server. Participation in Digital's Software Upgrade Services assures you immediate access to the most current releases of ADVANTAGE-NETWORKS software.
- From an integration standpoint, users are no longer confined to computing islands, defined by a network protocol. For example, OSI, TCP/IP, and DECnet users on a network can access each other's resources through a variety of application gateways, multiprotocol terminal servers and routers, and multiprotocol end-systems. Internet Standard RFC 1006 is now included on ULTRIX systems so that TCP/IP network users can access OSI applications. In an open systems environment, Network Application Support (NAS) products build on the system level integration provided by ADVANTAGE-NETWORKS. NAS is a comprehensive set of standards-based software products that provide for application integration across multivendor computing platforms.

All told, ADVANTAGE-NETWORKS gives you the power to use the most innovative, cost-effective solutions from multiple vendors, confident they will work together.

For more information on these and other product members of the ADVANTAGE-NETWORKS family, contact your Digital sales representative. Or call 800-DIGITAL (800-344-4825).

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Changing the game at Brookstone

CONTINUED FROM PAGE 77

data. The packages "let us have the time to change the foundation of the house," Stanley says.

That foundational change will take place over the next eight months. Primary to it will be the introduction of the AS/400 and the purchase of a commercial retail sales application that will be used as-is out of the box, according to Stanley.

Another advantage of using a prebuilt package will be to allow the IS department to concentrate on business issues rather than development, which is costly in both dollars and time. Information-related issues are critical to a company that makes all of its profit during a three-month period.

"We're really two companies," Stanley says. "Nine months out of the year, we're kind of floating along with low volumes. When all hell breaks loose, efficiency becomes almost secondary to timeliness and service."

As a result, Stanley says, the firm must react like a long-distance runner who needs to be able to maintain an efficient, strong pace through most of the race but must have a good kick at the end to remain competitive.

Brookstone has just come away from what Stanley describes as a "very good Christmas," but it is heading into a new year fraught with change — and not all of it pleasant. The end result, he hopes, will be a firm ready to compete in what is shaping up as a very difficult decade.

"We're going to be making sure that our systems implementations are able to withstand both the long, steady pace and the big kick," Stanley says.

Round 'em up

Brookstone followed a somewhat unusual path to computerization — a cow path, to be exact. The company rented its first computer time from a local organization, the Guernsey Cattle Club, more than a decade ago.

But computer systems designed to track bovine life histories are not necessarily well-suited to tracking product inventory, and finding ways to make such a system function has long been the work of Edward Stanley.

When Stanley started at Brookstone 11 years ago, the company was primarily mail order. It took in $20 million in annual sales from the catalog and $4 million from retail sales.

That situation has reversed itself in recent years, however. Currently, only $15 million of the company's $100 million in sales is derived from the catalogs. The rest comes from some 97 stores nationwide.

However, Brookstone's computer systems have long been pushing their limits. When the company moved from renting time from the Cattle Club to running its own system, the decision was made to hire away one of the club's programmers and buy an IBM 4381 rather than design a system from the ground up for sales.

"It was the easiest and quickest way," Stanley says. "The company was growing, and they didn't want to slow things down."

Brookstone paid a long-term price for the decision, however. Two years ago, the company decided to take serious action to head off what appeared to be an imminent systems collapse.

"We knew we were in tough times," Stanley says. "We knew we had to make some changes. We knew we had to survive a couple of Christmases."

Those changes, including a "right-sizing" from the mainframe to an AS/400 for retail operations, will be taking place over the next year.

CHRISTOPHER LINDQUIST

CALENDAR

FEB. 16-22

Information Security Managers Symposium. San Diego, Feb. 18-20 — Contact: Pamela Bissett, MIS Training Institute, Framingham, Mass. (508) 879-7999.

CASE World Conference & Exposition. Santa Clara, Calif., Feb. 18-20 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

FEB. 23-29

Annual Platforms For Computing (PC) Forum. Tucson, Ariz., Feb. 23-26 — Contact: Edventure Holdings, Inc., New York, N.Y. (212) 758-3434.

Eastman Kodak Co. Desktop Developer Conference. San Francisco, Feb. 24-25 — Contact: Gary Gibson, CMI, San Francisco, Calif. (415) 398-5352.

Object Oriented User's Group Organizational Meeting. Houston, Feb. 25 — Contact: Shelly Moore, Rothwell International, Houston, Texas. (713) 541-0100.

MARCH 1-7

ACM Computer Science Conference. Kansas City, Mo., March 1-7 — Contact: Don Nowak, ACM Headquarters, New York, N.Y. (212) 869-7440, Ext. 223.

10th Annual Computer-based Training Conference & Exposition. Orlando, Fla., March 2-5 — Contact: The Conference Department, Weingarten Publications, Inc., Boston, Mass. (617) 542-0146.

13th Annual Conference on IS Performance/Capacity Management. Scottsdale, Ariz., March 2-6 — Contact: Applied Computer Research, Inc., Phoenix, Ariz. (602) 995-5929.

Directions '92: IDC's 27th Annual Computer Industry Briefing Session. San Jose, Calif., March 5 — Contact: International Data Corp., Framingham, Mass. (508) 872-8200.

MARCH 8-14

The CIO Perspectives Series — The Business of IT: Finding the Payoff. San Diego, March 8-11 — Contact: CIO magazine, Framingham, Mass. (508) 935-4631.

EDP Audit Managers Roundup XIII. Orlando, Fla., March 9-11 — Contact: Pam Bissett, MIS Training Institute, Framingham, Mass. (508) 879-7999.

Third National Court Technology Conference. Dallas, March 11-15 — Contact: National Center for State Courts, Williamsburg, Va. (804) 253-2000.

Directions '92. IDC's 27th Annual Computer Industry Briefing Session. Boston, March 12 — Contact: International Data Corp., Framingham, Mass. (508) 872-8200.

Fifth International Computer Virus & Security Conference. New York, March 12-13 — Contact: Data Processing Management Association, New York, N.Y. (303) 825-8124, Ext. 190.

MARCH 15-21

Guide's '92 Spring Conference. Los Angeles, March 15-20 — Contact: Guide Headquarters, Chicago, Ill. (312) 644-6610.

Global Technology and Information Management: Europe. St. Louis, March 17-18 — Contact: Robert A. Rouse, Washington University Center for the Study of Data Processing, St. Louis, Mo. (314) 935-4791.

MARCH 22-28

Chief Networking Officers Forum. Washington, D.C., March 23-25 — Contact: Wilma Hurwitz, Technology Transfer Institute, Santa Monica, Calif. (310) 394-8305.

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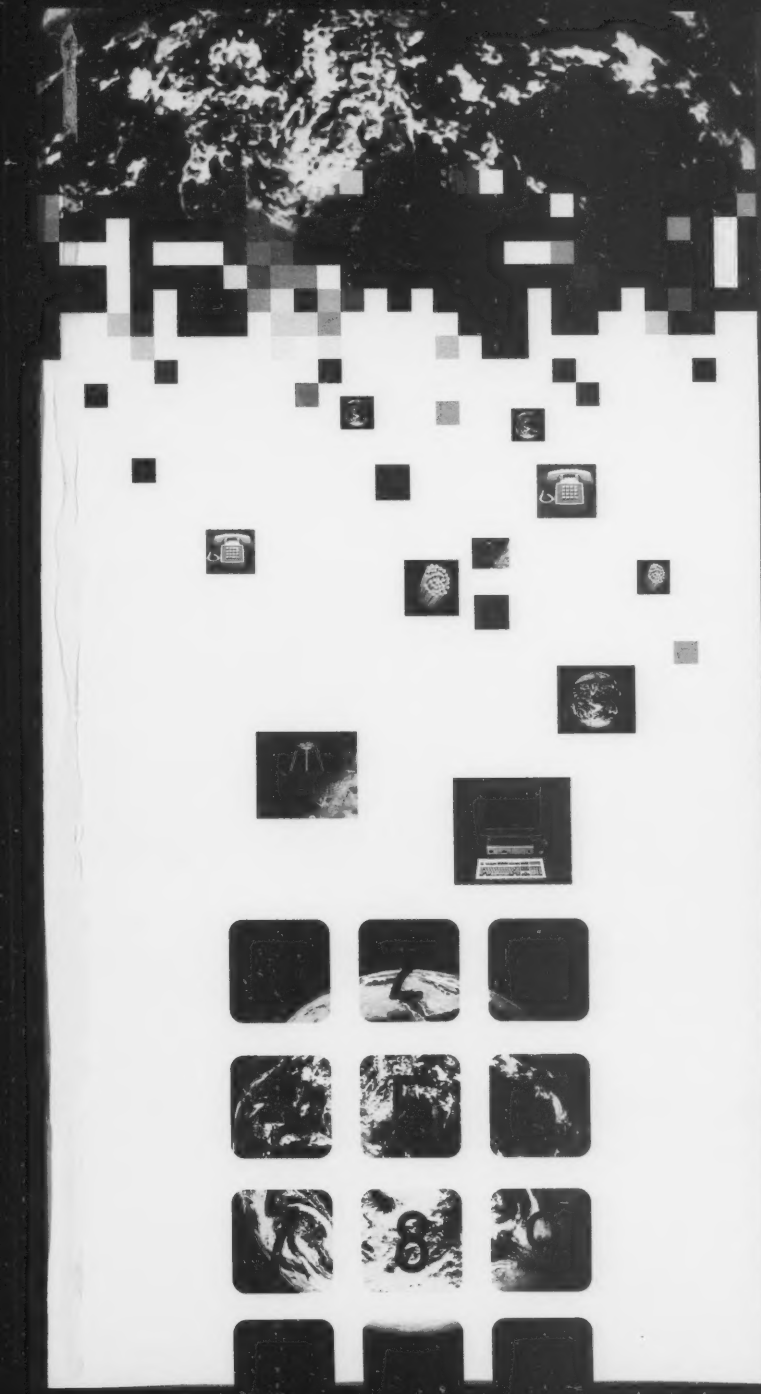

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Who We Are

SUPERCOMM® '92 Co-Sponsors:

USTA
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Based in Washington, D.C., USTA represents 1,100 local exchange telephone companies throughout the United States.

TELECOMMUNICATIONS TIA INDUSTRY ASSOCIATION

The 500-member association headquartered in Washington, D.C. represents manufacturers and suppliers of telecommunications equipment and services.

ICC '92 Sponsored by IEEE's Communications Society:

IEEE — The Institute of Electrical and Electronics Engineers

An organization with over 300,000 members worldwide, IEEE promotes the interests of the electrical engineering profession.

IEEE's Communications Society

This 30,000 member group within IEEE keeps electrical engineers with communications interests abreast of emerging computer and communications technologies.

Explore new gateways to knowledge as SUPERCOMM once again co-locates with the International Conference on Communications (ICC) – this year in Chicago at McCormick Place. This world-class exhibition and two premier conferences promise to be even more exciting, informative and global than ever before!

Don't miss your chance to hear the industry's top leaders. Attend dozens of informative seminars that will help your organization … and enhance your career. And get a hands-on view of the directions telecommunications will take in the future.

Over 450 exhibiting companies and 20,000 industry professionals from more than 80 countries are expected to attend. Meet and network with potential customers, multinational manufacturers, technology innovators, government policy makers, telcos, interexchange carriers, telecom/MIS managers, and other users.

How To Plan For The Telecommunications Event Of The Year

With three series of programming ranging from non-technical to technical, as well as the world's largest annual telecommunications exhibition, deciding what to see and do will be an exciting challenge! You'll be able to choose from the following:

Free Exhibits Tuesday – Thursday No Exhibits Monday

Because exhibit space has grown dramatically and is selling out earlier than ever, you'll be able to walk through more than 400,000 square feet of high-tech displays and see hundreds of new product demonstrations.

Three Valuable Feature Presentations – All Free – To Start Your Days

ICC '92 Vice Chairman Frank Splitt of Northern Telecom opens Monday morning with international panelists Theodor Irmer, Director of CCITT and Enrique Used Aznar, Chairman of Telefonica International. Discussion focuses on the changing world of international telecommunications and standards, exploring this year's overall theme: "Discovering a New World of Communications."

Tuesday morning, keynote speaker and Motorola Chairman George Fisher discusses "Learning to Compete in a Market-Driven Wireless World." As a driving force behind Motorola's success in wireless communications, Fisher will tell you what you need to know about wireless and how it will affect you.

Motorola Chairman George Fisher

The Wednesday morning Opening Session will highlight the role of telecommunications in education. Watch for more details in future brochures.

Major Addresses At ICC '92 Luncheon On Monday And Banquet On Tuesday

On Monday the ICC '92 Awards Luncheon will feature William L. Weiss, Chairman and CEO of Ameritech, providing insight on building an information society.

ICC '92 fee applies.

The ICC Annual Banquet on Tuesday night will be addressed by George Heilmeier, the new President and CEO of Bell Communications Research. Bellcore provides research and other technical support to the Bell Regional Holding Companies, Cincinnati Bell Telephone Co. and Southern New England Telephone Co.

ICC '92 fee applies.

Seminars And Lectures On Three Different Levels

Three different educational levels plus many tutorials and workshops – you choose the tracks which will benefit you most, and the speakers will bring you insight into a multitude of telecommunications issues.

100 Series Attend 43 *free* SUPERCOMM '92 non-technical seminars where you'll get a practical education and enter into lively Q & A on important and timely subjects ranging from fiber in the loop and network reliability to SONET and fast packet.

200 Series Also, approximately two dozen applications-oriented sessions are targeted to SUPERCOMM attendees by ICC '92. This practical and inexpensive programming will be most valuable to telcos, interexchange carriers, and telecommunications professionals from both public and private networks who need a somewhat technical viewpoint.

300 Series In addition, there will be more than 50 moderately priced ICC '92 technical sessions sponsored by the Communications Society of The Institute of Electrical and Electronics Engineers.

400 Series For technically-oriented professionals seeking an overview, ICC '92 also offers eight full-day and half-day tutorials and workshops.

SUPERCOMM Program Participation By A Wide Variety Of Organizations

From the Association of Data Communications Users to the Pacific Telecommunications Council and the Caribbean Telecommunications Council, leading organizations will conduct SUPERCOMM '92 seminars and bring you cutting-edge presentations. From the editors of *Communications Week* and *Communications News* to *TE&M, Telephony,* and *Network World,* you'll learn about the leading issues in your industry.

SUPERCOMM And ICC

Together offering you all the technical, non-technical and hands-on information you need to understand the telecommunications world of today and tomorrow.

New Matching Service Will Schedule Private Business Meetings At SUPERCOMM '92

Counterpart Business Matching Service will match and schedule companies for private one-on-one meetings at SUPERCOMM. Participating companies may choose the companies and the countries for the meetings. Meetings help SUPERCOMM companies expand sales, establish distributorships, or develop joint ventures in the U.S. or internationally. For more information and *Counterpart* registration forms, please contact Dr. Noreene Janus, Executive Vice President, *Counterpart*. Phone: (703) 524-8704, Fax: (703) 524-8705.

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Thursday, June 18: 9 am – 3 pm
(No exhibits on Monday, June 15)

	Monday	Tuesday
Exhibit Hours:	*No Exhibits*	*9 a.m. – 5 p.m.*

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100 Level

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■ **Primer**

8:00 – 9:00 a.m.
International Panel by ICC '92
9:30 - 10:45 a.m.
■**101** Synchronous Optical Networks – An Update
102 Developing European Digital Cellular Market
103 Evolving Information Environment – User Needs
11:00 a.m. - 12:15 p.m.
104 Applications and Implementations of SONET
105 Report Card on Investments in International Telecommunications
106 User Benefits/New Public Network Architectures
2:00 - 3:15 p.m.
■**107** The Basics of CCS/SS7
108 Opportunities in the Asia/Pacific Telecommunications Market
109 User Management of New Public Network Services
3:30 - 4:45 p.m.
110 Harmonious Hybrids in the '90s
111 The Caribbean – Telecom Growth Market
3:30 - 5:15 p.m.
112 HDSL: COPPER Value Just Went Up!

8:00 – 9:00 a.m.
Joint Plenary Session/Keynote Address
9:30 - 10:45 a.m.
113 Numbering Resources: Will We Run Out?
114 Where Will PCS & Cellular Meet in the Market?
115 Managing Growth in Evolving Public Network
11:00 a.m. - 12:15 p.m.
116 Exploring Transition to Competition
117 Information Services: Retail On-Line Transaction Processing
118 Money Matters: Fiber in the Loop – Part I
2:00 - 3:15 p.m.
119 Planning Considerations for CCS/SS7
■**120** Introduction to Fast-Packet Switching – Part I
121 New for '92: User Applications of ISDN
3:30 - 4:45 p.m.
122 Access Restructure – What's at Play for Small Companies?
123 Video Customer Premise Equipment
■**124** Introduction to Fast-Packet Switching – Part II

Grouped in three technical levels, the following are offered by ICC '92:

200 Level

For Everyone

9:30 a.m. - 12:15 p.m.
201 ISDN Services
202 FTTH – Network Migration Strategies
2:00 - 3:15 p.m.
203 ISDN Update
204 Key Issues for FITL Systems
3:30 - 4:45 p.m.
205 Near-Term IN Services
206 Quality Issues in Network Operations and Management

9:30 - 10:45 a.m.
207 Network Update: The Digital Transition
208 Technology Management
11:00 a.m. - 12:15 p.m.
209 SONET – Impact on the Network
210 Radio Access
2:00 - 3:15 p.m.
211 New Network Applications
212 PCS Network Evolution
3:30 - 4:45 p.m.
213 Private Digital Radio Networks
214 Advances in DLC Systems

300 Level

ICC Sessions

9:00 a.m. - 12 noon
301 Performance Analysis of Data Protocols
302 Technology Issues of Wireless Communications
303 Voice Technology Advances – Public/Private
304 Combining Radio and Fiber
305 Signal Processing for Digital Storage Systems
306 Packet Switching
307 Self-Healing Networks and Integrated Network Management
308 Management of High-Speed LAN/WAN Nets
309 Personalized TV
310 CDMA for Personal & Mobile Communications
2:00 - 5:00 p.m.
311 ATM Switching and Broadband Networking
312 Digital Cellular and Microcellular Systems
313 Application of Signal Processing in Coding
314 Communications Satellite Technologies
315 Queueing Performance of Data Networks
316 Network Survivability Performance
317 Specification Technologies for Software
318 Quality Management for Customer Satisfaction
319 Radio Design Techniques and Algorithms for Personal Communications
320 A Queueing Models for Data Communication Networks
320 B Advances in Video and Image Processing

9:00 a.m. - 12 noon
321 Emerging IN: Transition & Implementation Issues
322 Impact of Multimedia Services on Protocols
323 Modulation and Coding I
324 Performance Enhancement in PCS Radio
325 Dimensioning/Control of ATM Networks I
326 High-Speed Transmission Technology
327 Global Information Architecture
328 Land Mobile Satellite Communication Techniques
329 Adaptive Filtering in Pulse Shaping & ISDN
330 Photonic Switching and Interconnects
2:00 - 5:00 p.m.
331 PCN Radio Systems Engineering
332 Progress in Broadband Switching Systems
333 Modulation and Coding II
334 High-Speed Protocols
335 A Dimensioning/Control of ATM Networks II
335 B Network Control and Service Management in ATM Networks
336 Issues in Wireless Communication Networks
337 A Propagation Effects in Satellite Communications
337 B Multimedia Communications for Cooperative Applications
338 High-Speed MANs
339 Customer Evaluations

400 Level

ICC Tutorials And Workshops*

9:00 a.m. - 5:00 p.m.
401 Broadband Networking
Tutorial #1
9:00 a.m. - 12 noon
404 Telecommunications Management Network: Principles, Models and Applications
Tutorial #6
2:00 - 5:00 p.m.
405 Signalling System Number 7 for Fixed and Mobile Networks
Tutorial #6
12:15 – 1:45 p.m.
Awards Luncheon

9:00 a.m. - 5:00 p.m.
402 Broadband Services and Industrial Applications
Tutorial #2
9:00 a.m. - 12:30 p.m.
407 Network Synchronization
Workshop #1
2:00 - 5:00 p.m.
408 Technology Management: A Shifting Paradigm
Workshop #2
6:00 p.m.
Conference Banquet

For technically-oriented professionals seeking an overview. Register early – space is limited.

Wednesday

9 a.m. - 5 p.m.

8:00 – 9:15 a.m.
General Session
9:30 - 10:45 a.m.
125 The Basics of IN/AIN
126 The Ameritech PCS Trial
127 Distance Learning: Minds Across Miles
11:00 a.m. - 12:15 p.m.
128 Accelerated Modernization of Infrastructure and Economic Benefits
129 Delivering Enhanced Services to the Customer
130 Looking Ahead: Fiber in the Loop – Part II
2:00 - 3:15 p.m.
131 800 Number Portability
132 National Network Billing Services
133 New International Services for Corporate Users
3:30 - 4:45 p.m.
134 Infrastructure Sharing – Services for Small Companies
135 Dial-up Videoconferencing/When a Reality?
3:30 - 5:15 p.m.
136 Auto. Message Accounting Modernization

9:30 - 10:45 a.m.
215 Broadband ATM/STM Network Opportunities
9:30 a.m. - 12:15 p.m.
216 Significant Telecom Technology Standards
11:00 a.m. - 12:15 p.m.
217 Broadband Nets & Systems Experiments/Trials
2:00 - 3:15 p.m.
218 Architectures for Enhanced Services Platforms
219 Expert Systems in Telecom's Real Experiences
3:30 - 4:45 p.m.
220 Capturing Cellular Data Markets
221 Mass Market Telecom Services

9:30 a.m. - 12:30 p.m.
340 Photonic Networks I
341 Congestion Control & Routing in High-Speed Networks
342 Wireless Local Area Networks
343 Neural Network Techniques: Adaptive Filtering
344 Analysis & Design: Communications Systems
345 A Mobile Communication Networks
345 B Packet Radio Networks
346 Coding for Digital Storage Systems
347 Advanced Technologies in Management of Transport Networks
348 Advances in Data Communications
2:00 - 5:00 p.m.
349 Photonic Networks II
350 Advanced Techniques for Terrestrial Digital Radio
351 Adaptive Equalization of Time Dispersive Channels
352 AI Applications in Telecommunications
353 Digital Signal Processing for Satellite and Space Communications
354 Advances in ATM Switching
355 Global Quest for Quality
356 PCSs and Their Implementation

9:30 a.m. - 5:00 p.m.
403 Tutorial #3 Spread Spectrum Systems: Techniques and Applications
406 Tutorial #4 Satellite ISDN: Architectures, Technology and Applications

Thursday

9 a.m. - 3 p.m.

8:00 – 9:15 a.m.
137 Q&A for Small Telcos on Implementing Equal Access
9:30 - 10:45 a.m.
138 Perspectives on Advanced Intelligent Network
139 Wireless Data Communications – Taking Users Into the Future
140 Competitive Alternatives to the Local Loop
11:00 a.m. - 12:15 p.m.
141 Where the Rubber Meets the Road: Successful National ISDN Deployment
142 A User's View of Voice Processing Today
143 Preventing Network Outages

Please Note: Schedule Subject to Change

ICC Feature Sessions

(Free of Charge)

#318:
Quality Management for Customer Satisfaction
Monday, 2:00 - 5:00 p.m.

#327:
Global Information Architecture
Tuesday, 9:00 a.m. - 12 noon

Gigabit Networking Workshop

Tuesday & Wednesday
8:30 a.m. – 2:00 p.m.
(Fee Required)
For more info, see back cover.

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Locator/Hotel Map

1 The Bismark Hotel
2 The Blackstone Hotel
3 Chicago Hilton & Towers: ICC '92 HQ
4 The Congress Hotel
5 Days Inn
6 The Drake
7 Embassy Suites
8 Essex Inn
9 Executive House
10 Forum Hotel
11 Grant Park Hotel
12 Guest Quarters
13 Holiday Inn City Centre
14 Holiday Inn Mart Plaza
15 Hotel Intercontinental
16 Hotel Nikko
17 Inn of Chicago
18 The Knickerbocker
19 The Lenox House
20 The Marriott
21 McCormick Center
22 The Oxford House
23 Palmer House Hilton
24 Ramada, Lake Shore
25 The Richmont Hotel
26 Sheraton Chicago
27 Sheraton Plaza
28 Stouffer Riviere
29 The Tremont

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5	Days Inn 644 N. Lake Shore Drive	150	$ 99	$109
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7	Embassy Suites 600 N. State Street	100	$155	$155
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19	The Lenox House 616 N. Rush Street	100	$ 99	$109
20	The Marriott 540 N. Michigan Ave.	800	$161	$181
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Professional Responsibility _____ (Use letter from #2 below)

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CW

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First Last

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11 Bell Operating Companies
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14 Foreign Telcos

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15 Bell
16 Independent

Other Carriers
17 Long Distance
18 International
19 Mobile/Cellular
20 CATV/Radio/TV

Other Telecom Providers
21 Telecom Manufacturers
22 Dealers & Distributors
23 Contractors & Electrical Services
24 Consultants & Architects
25 Financial & Leasing Companies
26 Data Communications Equipment Manufacturers
27 Data Communications Services
28 Telecommunications Associations

Telecom Users
29 Educational
30 Financial/Investment
31 Hospitals/Health Care
32 Hotel/Motel
33 Legal/Insurance/Real Estate
34 Publishing
37 Research & Development
38 Stadiums/Convention Centers
39 Trade (Wholesale/Retail)
40 Transportation/Pipelines
41 Utilities (Gas/Water/Electric)

Government
42 Government/Regulatory
43 Military
44 Foreign

Other
46 Press
50 Spouse/Child (non-industry)
51 Other

2. PROFESSIONAL RESPONSIBILITY

Choose ONE that best describes your professional responsibility. (Also enter on form above under your address.)

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	Before May 25	After May 25	TOTAL	CODE
IEEE, USTA, or TIA MEMBER REGISTRATION				
1 Full – Includes all Sessions, Record, Exhibits, Awards Luncheon, Banquet	$275	$325	$ _____	1
2 LIMITED – Includes all Sessions, Exhibits, Record	190	230	_____	2
3 1-DAY – Includes all Sessions, Exhibits (Circle one: MON TUES WED)	145	145	_____	3
4 LIFE MEMBER – Includes all Sessions, Exhibits	5	5	_____	4
NON-MEMBER REGISTRATION				
5 FULL – Includes all Sessions, Record, Exhibits, Awards Luncheon, Banquet	$375	$425	_____	5
6 LIMITED – Includes all Sessions, Exhibits, Record	290	330	_____	6
7 1-DAY – Includes all Sessions, Exhibits (Circle one: MON TUES WED)	245	245	_____	7
OTHER				
8 SERIES 200 SESSIONS ONLY, Exhibits	$ 70	$ 90	$ _____	8
9 STUDENT – Includes all Sessions, Exhibits	5	5	_____	9
OPTIONS *(In addition to items included in Registration Fee above)*				
A Tutorial # 1 – Broadband Networking (Monday all day)	$135	$155	$ _____	A
B Tutorial # 2 – Broadband Services and Industrial Applications (Tuesday all day)	135	155	_____	B
C Tutorial # 3 – Spread Spectrum Systems (Wednesday all day)	135	155	_____	C
D Tutorial # 4 – Satellite ISDN (Wednesday all day)	135	155	_____	D
E Tutorial # 5 – Telecommunications Management Networks (Monday morning)	60	70	_____	E
F Tutorial # 6 – Signalling System #7 for Fixed & Mobile Networks (Monday afternoon)	60	70	_____	F
G Workshop # 1 – Network Synchronization (Tuesday morning)	60	70	_____	G
H Workshop # 2 – Technology Management (Tuesday afternoon)	60	70	_____	H
I Gigabit Networking Workshop (Tuesday and Wednesday)	295	395	_____	I
K Awards Luncheon (Monday) QTY_____	35	40	_____	K
L Conference Banquet (Tuesday) QTY_____	50	55	_____	L
M Addl. Conference Record QTY_____	70	85	_____	M
N Shipping Conf. Record QTY_____ *(To listed street address – U.S. only)*	15	15	_____	N
FEATURE SESSIONS				
O Quality Management for Customer Satisfaction (Monday afternoon)		(free of charge)		O
P Global Information Architecture (Tuesday morning)		(free of charge)		P
SOCIAL EVENTS				
Q Chicago Highlights/Oceanarium (Monday morning) QTY_____	$ 25	$ 30	$ _____	Q
R Monday Night at the Museum QTY_____	53	58	_____	R
S Highlights, Chicago's Gold Coast (Tuesday morning) QTY_____	24	29	_____	S
T Cooking Demonstration (Tuesday afternoon) QTY_____		(free of charge)		T
U Art Institute/Shopping (Wednesday morning) QTY_____	23	28	_____	U
TOTAL REMITTANCE Must be in U.S. Dollars *(No refunds for cancellations after May 25, 1992)*			$ _____	

Telecom/MIS Managers: Don't miss *Network World's* four SUPERCOMM seminars on new public network architectures and services, ISDN applications and new international services for end users. Also, half a dozen other seminars ranging from user needs and concerns, private/public network management, and information services to video services, wireless data communications, and network reliability. All seminars feature panel format, Q&A and *no charge to attend.*

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Free access to the SUPERCOMM '92 exhibition by 450 manufacturers and suppliers – including many demonstrating applications of broadband solutions available today – is included in the $295 registration fee ($395 after May 25). Free access to SUPERCOMM seminars and to high-speed networking and other key sessions at the co-located ICC '92 is also included.

Pre-register using the form on the previous page of this brochure – line I. Or call (312)782-8597 for additional information. Seating will be limited for this in-depth private networking workshop, so please act promptly.

A Special Thanks!

... to *Telephony Magazine* and *Network World* – official publishers for SUPERCOMM® '92 and ICC '92. Watch for important information-packed brochures inserted in the March 2 and April 6 issues.

Telephony

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LAN management

There are thousands of things that need to be managed on interconnected LANs, from hardware to protocols to administrative tasks

BY BOB JANUSAITIS

With all the talk of downsizing, you may have started to look into the tools available to manage a local-area network-based environment. What you've probably found are a lot of network monitors, many protocol analyzers and several intelligent wiring stations, or smart hubs.

All three categories notify the LAN administrator of crucial network problems. In fact, smart hubs address the estimated 60% of network-related problems that occur at the cable or network interface card level. Protocol analyzers and monitors address the other 40%, such as packet storms and improper protocol implementation, which occur at the protocol level (see story page 94).

But there's a lot of day-to-day management and administrative information that those products completely bypass. For instance, a protocol analyzer may tell you that there's trouble at a particular bridge or router, but it doesn't tell you where that bridge or router is.

The holes in available LAN management products are apparent when you compare available tools with mainframe-related offerings, such as Goal Systems International, Inc.'s OPS/MVS, IBM's Netview and Digital Equipment Corp.'s Management Control Center.

However, while there is no comprehensive tool set that addresses all LAN management issues (see list of comprehensive functions, page 93), third-party developers are beginning to address some key areas, such as the following:

- Configuration documentation.
- Inventory.
- Backup.
- Hardware monitoring.
- Virus prevention.
- Software metering.

Janusaitis is a certified Netware engineer and a certified IS auditor. He is responsible for the LAN Auditing and Disaster Recovery practice at Business Systems Group Consulting in Houston.

Most of the products in these categories work across multiple networks. However, the majority operate only in the Novell, Inc. Netware environment, although several products specific to Banyan Systems, Inc.'s Vines, Apple Computer, Inc.'s Appletalk and Microsoft Corp.'s LAN Manager are also available. Only a few products have begun to operate with multiple operating systems.

LAN Documentation

Documentation is an area people love to ignore, mostly because it's perceived as requiring an enormous amount of time and energy. The fact is, you should know at any given moment what you have on the LAN, especially if the network fails.

Documentation or configuration products can reduce the time and effort of documenting a LAN to less than several hours. They track LAN components specific to the file server, including hardware components — such as disk drive configurations, volume names and network interface cards — and software components, such as memory address information, server directory structures and user security information.

Netware Management from Frye Computer Systems, Inc. provides the most plentiful documentation in this group of products. In product tests, it took less than three hours (including printing) to gather three 3-in. binders full of documentation, amounting to approximately 2,000 pages of information, including server hardware configuration, directory structure of the file server, user names and trustee assignments.

Network Management, which is Netware-specific, is easy to install, has a suggested retail price of $495 and essentially pays for itself the first time it is used. Multiple servers may be licensed.

Michael S. Klein

A less robust but more focused product is Bindview ($395) from The LAN Support Group, Inc. While it does not provide operating statistics, it does provide a more focused view of the network for users who don't want to sift through hundreds of pages of information.

For example, you can filter a query to see only the files bigger than 1M byte on the system. This feature is particularly useful on file servers with a large number of users or a complex directory structure.

In the Vines environment, Trellis Software, Inc.'s Expose not only documents the system but also monitors performance, assists in problem resolution and provides a network map. Because it is so comprehensive, it is also expensive — $1,250 per server plus $2,995 for the monitor software.

LAN Inventory

LAN inventory products are similar to documentation products in that they provide the LAN administrator with essential information about the LAN makeup. However, they work at the client, or workstation, level to report on such things as the type of CPU, amount of disk space, what DOS version or network shell is being used, CONFIG.SYS files, AUTOEXEC.BAT files, disk drive size and

Continued on page 93

INSIDE

What's New in Monitors? Analyzers, monitors have seen lots of advancements. Page 94.

Buyers' Scorecard Openview tops user ratings of enterprisewide managers. Page 96.

Product Guide A comprehensive list of inventory management tools. Page 98.

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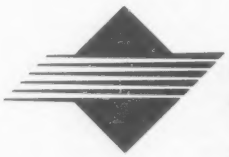

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Managing interconnected LANs

CONTINUED FROM PAGE 91

a listing of software.

Some products provide only hardware information, such as Horizons Technology, Inc.'s LAN Auditor. LAN Auditor operates on Netware, Vines and LAN Manager. A Microsoft Windows version is also available. It costs $495 for the first 100 nodes and $295 for each additional 100 nodes.

Frye's LAN Directory, although Netware-specific, goes beyond LAN Auditor to inventory software and permit custom reporting. It costs $495 for the first 50 nodes and $395 for each additional 100 nodes.

Neither product requires a terminate-and-stay-resident program, so you don't have to worry about memory problems. And both can be run at any time — each time the user logs in, if desired.

In the Apple Macintosh environment, Macvonk U.S.A. recently released Netoctopus network management software, a comprehensive tool that manages hardware inventories, site license agreements and software upgrades.

Backup & Restoration

LANs are most vulnerable when it comes to data backup. According to Maynard Electronics, Inc., a vendor of backup products, only 17% of LANs are backed up on a regular basis.

Every LAN should have tested backup and restoration procedures. There should be backup not only for the server but also for the individual workstations.

Most tape backup software is relatively unintelligent and requires the LAN administrator to maintain a log or otherwise manually keep track of tape rotation. As larger disk drives emerge, however, a fundamental change in the way we perform backups is required. With upwards of 20G bytes now available on a server, it is not reasonable to do a full backup every evening.

This has brought about the necessity for products that back up data on an incremental basis — for instance, a nightly backup of files that have been changed.

While several products have that capability, Palindrome Corp.'s The Network Archivist (TNA) includes software that manages those files intelligently. TNA addresses storage management, archiving, tape rotation and backing up nodes on the network. It is easy to install and operate and restores files rapidly.

Although it is not as easy to use as TNA and is incapable of tape rotation, Maynard Electronics' Maynstream is the only product on the market that permits the owner of a file to back up or restore his own files without LAN administrator intervention. It also backs up nodes and provides archiving.

Other manufacturers of tape systems include Emerald Systems, Inc. and Mountain Network Solutions, Inc. Both provide basic backup features such as tape cataloging and node backup.

Hardware Monitoring

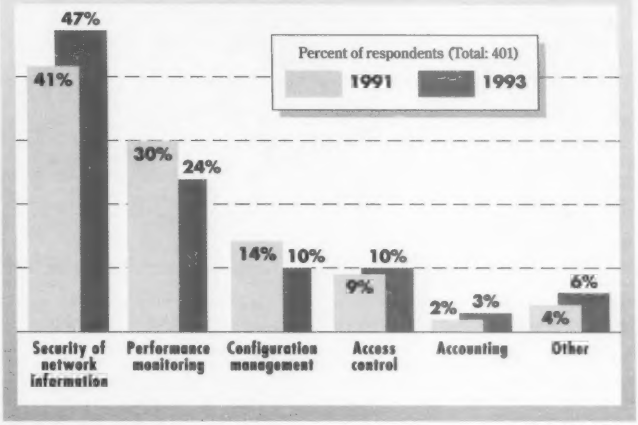
One area that network monitors generally don't track is the server. Consequently, some vendors now offer hardware monitors, which allow the LAN administrator to set specific parameters for servers — such as maximum and minimum volume space — to ensure the LAN server is operating within its limits.

Early Warning System ($495) from Frye notifies LAN administrators of server-based problems before they become critical. Notification can come in the form of electronic mail, pager, voice and fax. The system can also be programmed to archive files if the volume exceeds the threshold.

Monitrix from Cheyenne Software, Inc. also provides hardware monitoring, in addition to other functions such as limited inventory reporting. Monitrix is Netware-specific and costs $895.

Management priorities

Based on a study of 401 LAN administrators, security is and will continue to be the top concern for managing LANs



Source: Business Research Group

CW Chart: Marie Haines

Virus Prevention

There are now 1,850 network viruses in existence, and the frequency of their attack is on the rise. Little wonder that in a recent survey by Business Research Group, a market research firm in Newton, Mass., 41% of LAN administrators named "security" as the most important function in managing the personal computer LAN, even above "performance" (see chart).

As a result, vendors are starting to address virus protection as an important part of securing the LAN. Currently, there are only two products on the market that are server-based virus protectors. Sitelock from Brightwork Development, Inc. operates as a Netware Loadable Module or value-added process. It costs $995 per server and can also inhibit unauthorized execution from local workstation drives.

Untouchable Network from Fifth Generation Systems, Inc. uses a proprietary algorithm to accomplish the same goal. It costs $695 for a 10-node starter kit and an additional $85 per node.

Software Metering

Software metering products are an inexpensive way of proving you're in compliance with software copyright laws.

Managing software license agreements is not a particularly popular issue. But while very few companies have installed software metering products, the issue of copyright adherence looms large.

Several products provide software metering by requiring the LAN administrator to enter the total number of licensed copies per server into the metering software database.

Connect Computer Co.'s Turnstyle ($395) checks its database as a file that is about to be executed. If the execution of the file would cause the number of licensed users to be exceeded, the product notifies the user that the application is not available.

Turnstyle operates with Netware, Vines and LAN Manager in either terminate-and-stay-resident or batch mode.

Brightwork Development's Sitelock ($995) operates as a Netware Loadable Module and places the user in a queue if the application is not available.

A lot of growth is expected in all these areas of LAN administration and management, to the point that comprehensive systems management may well grow beyond that of today's mainframe systems. Expert systems will play a large part in relieving the LAN administrator of the mundane but essential tasks of day-to-day LAN management.

Vendors of all the components — network operating systems, protocol and packet analysis, smart hubs and LAN administration — need to combine efforts to integrate their information. That would be comprehensive LAN management. •

Full coverage

The following is a list of components that should be included for comprehensive LAN management coverage:

▶**LAN documentation and inventory.** Essential LAN documentation includes LAN policies and procedures, hardware configurations, cabling diagrams, service contracts and purchasing procedures.

▶**Hardware maintenance and monitoring.** This should include preventive maintenance logs, an inventory of spare parts, upgrades of hardware components and monitoring hardware.

▶**Mission-critical systems.** You need to identify mission-critical systems and steps to recover them.

▶**Operating system maintenance.** Procedures are necessary to ensure that patches to the operating system are loaded on a timely basis. You also need controls to ensure that operating system maintenance does not impact performance.

▶**Security, virus and software metering.** Security should address the file server, workstation hardware, log-on access and classification of data sensitivity on local-area and network drives. This includes virus prevention/detection and compliance with software licensing agreements.

▶**Fire protection.** This includes prevention, detection and suppression methods.

▶**Backup and restoration.** Every LAN needs tested backup/restoration procedures. These include a rotation schedule for off-site tapes, security for the tapes and review of backup procedures for workstations and backup software.

▶**Business resumption planning.** It is critical to have an up-to-date, tested disaster recovery/business resumption plan.

▶**Network design/performance.** This includes network implementation guidelines and, on large LANs, a protocol analyzer to determine performance bottlenecks.

▶**Help desk, problem resolution.** A properly staffed and trained help desk needs to be functioning, with adequate resources to provide assistance to clients.

▶**Administration and setup.** Procedures should be established to ensure that the LAN is administered in accordance with management's mission.

▶**Training.** All personnel involved with the LAN should be properly trained.

▶**Vital records.** Off-site storage of vital company records is crucial, including magnetic media, manuals and procedures to ensure that company operations can continue without interruption in the event of a disaster. This may include electronic vaulting.

Monitors, analyzers seek trouble — with a twist

BY JILL HUNTINGTON-LEE

If you haven't shopped for a local-area network monitor or analyzer lately and you're expecting a dull lineup of black boxes that do pretty much the same thing, you may be in for a surprise.

Last year's blitz of new and enhanced products created a new climate in the LAN analysis market — with technologies ranging from expert systems to distributed architectures.

LAN analyzers and monitors are being used by the many organizations that have yet to invest in enterprisewide management solutions, such as Sunnet Manager from Sunconnect (a division of Sun Microsystems, Inc.) and HP Openview from Hewlett-Packard Co. (See Buyers' Scorecard, page 96).

Whereas enterprisewide systems continuously poll devices throughout the network for status information, LAN monitors are passive devices that can collect data on both Simple Network Management Protocol (SNMP) and non-SNMP nodes. Once a monitor detects a problem area, a LAN analyzer is often brought in for in-depth problem diagnosis.

The most popular LAN monitoring gear can be divided into three categories: high-end protocol analyzers, LAN segment or traffic monitors and software-only monitoring utilities (see chart page 95).

Huntington-Lee is a principal at Brandywine Network Associates in Cinnaminson, N.J., specializing in network management market research, product analysis and free-lance writing.

High on the list

At the high end, protocol analyzers such as Sniffer from Network General Corp. in Mountain View, Calif., and Novell, Inc.'s Lanalyzer deliver maximum functionality but can easily cost $20,000 or more. The best analyzers support a wide variety of protocols and can decode all seven layers of the Open Systems Interconnect model, from faulty cables or network interface cards (at the physical layer) to software bugs (at the application layer) to bridges and routers (at in-between layers).

The latest trend in high-end analyzers, according to Mark Miller, president of Diginet Corp., a consulting firm in Denver, is to roll LAN and metropolitan- and wide-area network capabilities into one box. "These analyzers can diagnose network ills on both sides of the link," Miller explains, "such as Token Ring on the LAN and [Synchronous Data Link Control] on the WAN."

On the ultra-high end, Wandel & Goltermann, Inc. in Research Triangle Park, N.C., has designed the DA-30 analyzer for large heterogeneous networks. The DA-30 allows users to simultaneously test two network segments with different topologies — for example, Ethernet LAN and RS-232 — to view what's happening in real time on both sides of the junction.

Michael S. Klein

Expert systems

Nothing beats one of these high-end protocol analyzers — as long as you can figure out how to use it. But because of the expense and difficulty of hiring experienced technicians, it's not surprising that the phrase "expert systems" is now a buzzword in the analyzer market.

Because they are notoriously difficult to implement, there are very few products that incorporate expert systems on the market today.

One of the few (and the first) to announce a LAN analyzer with an expert system component is HP, which incorporated Fault Finder in its Network Advisor in May 1990. Fault Finder suggests causes of network anomalies and makes recommended solutions. While expert systems are notoriously slow and buggy, Fault Finder represents a key step toward making analyzers easier to use.

Network General has promised to follow suit with its own expert system for Sniffer this year.

In lieu of an expert system, Novell includes preprogrammed tests and "applications that are easy to modify," says Robert Burrell, LAN administrator at Ethicon, Inc., a subsidiary of Johnson & Johnson in Somerville, N.J. Burrell uses Lanalyzer to display IPX protocols for network-layer debugging.

Adding RISC

Expert systems and other ease-of-use features require added power. To that end, a recent trend among vendors is to add reduced instruction set computing (RISC)-based processors, which not only support faster decodes but also enable machines to preprocess raw data into more concise, useful information.

One such product is Trakker, unveiled this past summer by Concord Communications, Inc. in Marlboro, Mass. Trakker uses RISC-based monitors to preprocess and correlate protocol and traffic data before displaying it in real time. It also collects data across distributed networks and reports back to central console software. Trakker supports limited protocol analysis but is much easier to use than traditional protocol analyzers.

At Compaq Computer Corp., Trakker has allowed operators to be assigned to monitors, freeing up engineers for other tasks. "No other analyzer keeps the kind of historical data that Trakker does," says Mike Pate, manager of engineering networks. "And with the real-time capability, I don't have to try to recreate problems in order to debug them."

LAN segment monitors

If the typical $20,000 to $35,000 protocol analyzer price tag strains your budget, less expensive traffic monitors can provide some help. LAN segment monitors are hardware-based tools that typically cost from $3,000 to $10,000.

Traffic monitors do not decode protocols, but they can provide summary statistics that indicate performance trends or bottlenecks. You'd then need a protocol analyzer to diagnose the problem.

Monitors are often purchased to meet a specific need. "Some users just want to find out when the peak traffic periods occur each day," Miller says. Other users are attracted to monitors because they are easier to use than protocol analyzers.

However, networks tend to grow

When to use what

The new functions on network monitors are not for everyone. Here's some suggestions for when they are best put to use.

▶**Expert systems:** Human expertise unavailable or too expensive to obtain.

▶**RISC-based processing:** Monitoring high-speed networks, building complex networks and/or stress-testing. Possible future support for expert systems.

▶**Low-end software:** For single-segment LANs with homogeneous makeup; possible supplement to protocol analyzers; ease of use is a prime consideration.

▶**Simultaneous LAN/WAN analysis:** Building and/or maintaining complex, heterogeneous networks with a mix of topologies; anticipated changes in network size and protocols used.

▶**Distributed architecture/remote monitoring:** Continual monitoring required on critical LAN segments (where any downtime at all is catastrophic); geographically dispersed LAN where trained personnel are at central site only.

▶**Rmon MIB support:** User organization is committed to open systems/enterprisewide SNMP implementation.

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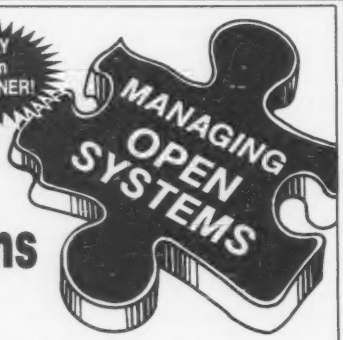

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Hey man, it's Rmon

There's something called the Rmon MIB that's making a big splash in traffic monitors lately.

It all started when traffic monitors started being incorporated more and more into SNMP management stations. The SNMP station provides the sophisticated graphical user interface that most monitors lack. For their part, monitors obtain traffic statistics and other data from non-SNMP devices that the SNMP station may not pick up during routine polling cycles.

MIBs, or "management information bases," come into the picture when the monitor needs to share the information it collects with the SNMP station. The monitor must first translate the collected data into SNMP format and deposit it into the MIB, which the SNMP station can read.

While MIBs are proprietary by their very nature, some vendors release their MIB definitions to other vendors to market product combinations. For example, Novell has provided its Lantern MIB to no less than 14 SNMP management vendors in the past 18 months.

The LANCE+ management system from Lexcel in Nutwood, Calif., uses the Lantern MIB to gather traffic data and then present digested information in the form of graphical charts and reports.

In this way, SNMP has helped cut through the morass of managing heterogeneous networks. However, the proliferation of different MIBs has created headaches for LAN administrators. A device's MIB may contain anywhere from 50 to 4,000 different measurements, called "variables."

Enter Rmon. The Internet Engineering Task Force, which oversees SNMP standards development, is working to create standard MIBs in several product areas. The first of these efforts to approach finalization is the remote monitoring — or Rmon — MIB, which defines a basic set of variables that all LAN monitors can support.

"The Rmon MIB will make the marketplace more organized and will help users make better price/performance comparisons," explains Michael Erlinger, Lexcel's director of networking and chairman of the Rmon MIB Working Group.

"We're beginning to clean up the inconsistency between metrics supported by various vendors — and we're talking about thousands of metrics," agrees Kornel Terplan, an international network management consultant at Performance Navigation, Inc. in Hackensack, N.J., and Munich.

JILL HUNTINGTON-LEE

more complex as they evolve — and more likely to develop problems requiring in-depth diagnostic information that monitors can't deliver. Fortunately, new hybrid tools, such as Concord's Trakker, are beginning to bridge the gap between fault detection and diagnosis.

Distributed architectures

At both the midrange and the high end of the market, analyzers and monitors with distributed capabilities have been pegged as a godsend by LAN administrators. Because these products can monitor diverse networks — even at remote locations — they can cut down on expenses in two ways: less travel and less downtime.

Most major vendors — including Network General, Novell, Spider Systems, Inc., Protools, Inc. and HP — have introduced distributed architectures in which permanently attached probes run continuously, forwarding alarms and other data to a central console.

"Before we bought [Spider's Spiderprobes], it was not uncommon for me to get a call at 4 p.m. and be on location at midnight debugging the remote LAN," says an engineer at a major financial services company. The user, a technical support engineer, is responsible for multiple network sites in several states.

"After installing Spiderprobes last year, I've cut down most of the traveling and prevented downtime as well," he continues. "Now, I look at the probe output on a regular basis and can see if a LAN card is bad; I tell the local administrator to pull it out, and we avert a major broadcast storm."

Low-end monitoring

At the lowest end of the market are software-only monitoring utilities. These products range from Ethernet tools that capture and display packets in real time (such as Walnut, Calif.-based Avant Garde Group's Etherpeek) to software packages that keep tabs on Novell servers, such as the popular Frye Utilities from Frye Computer Systems, Inc. in Boston.

Not just a "poor man's monitor," these products are capable of triggering alarms on server status and collecting data that the more expensive products don't track.

Burrell is now considering Frye Utilities to supplement the capabilities of his Novell Lanalyzer. "It's possible to monitor servers with Lanalyzer, but Frye Utilities will trigger an alarm when a server drops out of the network — that's what I need."

Some users of single-segment and homogeneous LANs rely strictly on low-price utilities for performance data. However, many users who start out with software-based Ethernet monitors often upgrade to faster, hardware-based systems as network needs evolve. Documentation, service and support are sometimes minimal with the lowest priced monitors.

With new product features appearing every month, the wide variety of equipment can create problems for prospective customers.

"Purchasing the wrong tool is worse than not buying anything at all," cautions Chuck Haggerty, a senior analyst at Datapro Information Services Group in Delran, N.J. "Users should evaluate the different types of equipment available before selecting a vendor." •

High and low

There are troubleshooters for every kind of LAN

High-end: Protocol analyzers

Provide detailed layer-by-layer breakdown of LAN packets via English-like descriptions of protocol decode; filters and applications help users pinpoint exact cause of corrupted data, excessive traffic or other anomalies.

Price range: $10,000 to $35,000

Market leaders:
- **Hewlett-Packard**, Colorado Springs — *Network Advisor, HP 4972 A*
- **Novell** Lanalyzer Division, San Jose, Calif. — *Lanalyzer*
- **Network General**, Menlo Park, Calif. — *Sniffer, Distributed Sniffer*

Midrange: LAN segment monitors

Collect traffic statistics (total packets, bytes, errors; most active stations, most active protocols); help in network planning, such as detecting overloaded segments before disaster occurs, buying time to implement alternate or added routes.

Price range: $3,000 to $10,000

Market leaders:
- **Hewlett-Packard**, Colorado Springs — *Lanprobe*
- **Novell** Lanalyzer Division, San Jose, Calif. — *Lantern*
- **Spider Systems**, Burlington, Mass. — *Spidermonitor, Spiderprobe*

Low-end: Software-only activity monitors

Provide various selected statistics (traffic load, frame size distribution, server status) and some rudimentary and/or partial protocols. Limited in speed and power. Typically unable to keep up with traffic on busy networks or complex internets.

Price range: $300 to $3,000

Market leaders:
- **Avant Garde Group**, Walnut Creek, Calif. — *Etherpeek, Net Alert*
- **Cheyenne Software**, Roslyn, N.Y. — *Monitrix*
- **Frye Computer Systems**, Boston — *Frye Utilities*
- **Network Computing**, Dallas — *Lanalert*

Source: Brandywine Network Associates

CW Chart: Marie Haines

'92: The Year of Cutting Through Hype

BY MARC DODGE

I just had a terrible thought: Since 1987, every year has been proclaimed "The Year of the LAN." Now that that's over, will pundits proclaim each year of the '90s as "The Year of Network Management?"

For United Parcel Service and most everyone else, managing a multivendor LAN or WAN environment is unsettling at best, and vast changes to that predicament aren't likely for two years, anyway. All of us have to build our own network management systems using one or more pieces from each vendor. This means multiple consoles, lots of training and anxious network managers.

There's no better way to explain than to look at reality. UPS' corporate IS group has a campus of six buildings. Managing the LAN backbone connecting the buildings requires multiple network management systems, so the help desk has separate consoles to monitor the following elements:

- Individual LAN performance (from Novell).
- Intelligent LAN wiring hubs (from Synoptics Communications).
- Gateways linking the LANs to the host (from Novell).
- Bridges and the backbone tying the LANs to each other (from IBM).

And this just covers the campus. The WAN or telecommunications network requires another half dozen systems and consoles. Throw in a few protocol analyzers, wire scanners and network management software utilities, and the "system" is complete.

This is the way it is for most of us. Fortunately, it works, and it will be adequate until the promise of integrated network management systems (INMS) is delivered — probably in 1994 or later. At the same time, we realize things must change within two or three years.

UPS plans to build its own INMS by 1994 by writing software to link its network elements to a vendor's core INMS. This year, the data transport elements of the WAN will be built into the INMS, including the multiplexers, switches and modems. In 1993, the LANs, bridges and routers will be added.

The final umbrella system will include a single database and single graphical user interface. Most of the LAN and WAN network will be visible from one workstation. Parts of the management will be decentralized and available from anywhere within the network.

There is more smoke and fog in network management than in any other area of information technology. If we understand that true INMSs are at least two years away, we can plan accordingly. At the very least, we won't fall for "The Year of Network Management" rhetoric.

Dodge is manager of the telecommunications network management group at UPS in Mahwah, N.J.

BUYERS' SCORECARD

Openview satisfaction rises; Sunnet's declines

BY DEREK SLATER
CW STAFF

Companies seeking software to control their local-area networks can buy a collection of products from different vendors to provide discrete management functions, or they can purchase a network management platform that offers various functions through a mixture of modules. If they select the latter route, there are few choices.

Among the three products that have emerged as market leaders in this field — Hewlett-Packard Co.'s Openview, Sun Microsystems, Inc.'s Sunnet Manager and IBM's Netview — HP's Openview received the highest satisfaction ratings from its users in a survey conducted earlier this month.

In last year's Scorecard on LAN management [CW, May 27, 1991], Openview shared top honors with Sunnet Manager, scoring 69 points overall. Users rated Openview higher this year (71), while Sunnet Manager fell to 64 overall. Users rated Sunnet Manager lower this year than last in three of the five most important categories.

As a result of Sunnet Manager's five-point drop, the mean score fell from 66 last year to 65. IBM's Netview, like Openview, gained two points.

Users' priorities have also changed over the past year. The importance of a product's ability to manage large networks changed most significantly: The category ranked sixth overall with an importance rating of 7.8, compared with a 7.3 rating last year.

Each user group rated only its own products, assigning a 1-to-10 rating for each category area, with 10 being very good. Overall scores were derived by multiplying the mean ratings each user group gave its product by the mean importance factors assigned to the criteria by all respondents. Scores were then converted to base 100. The response base for the survey was 34 for Openview, 24 for Sunnet Manager and 40 for Netview.

Openview earned the top score in 13 categories this time around, including five of the six areas users rated as most important: responsiveness of vendor service, quality of technical support, overall ease of use, value for the dollar and ability to manage large networks. HP's technical support and responsiveness of service both earned ratings of 8.0, its highest marks. In several categories Openview scored well above its competitors.

Low-scoring areas for Openview were security management (6.0) and management of traffic on modems and multiplexers (5.5), although users rated the latter as the least important criterion in the survey.

Overall, Openview users reported a high level of satisfaction with the product; all 34 users surveyed said they would purchase Openview again.

The second-place finisher, Sunnet Manager, tied for first in one category: providing accounting information. The product finished third in four of the six key ratings. Four of the users said they would be unlikely to purchase it again, citing difficulty of use and lack of diagnostic power.

Particularly low grades in integrating with other vendors' products hurt IBM's Netview, which finished third overall. Netview users assigned it a 5.1 rating in managing other vendors' equipment and a 4.7 for its support of other firms' Simple Network Management Protocol extensions. These scores offset Netview's first-place grade in fault tolerance and troubleshooting (6.8). Netview also ranked second in three of the six key categories: responsiveness of service, ease of use and ability to manage large networks.

Netview's highest scores were in responsiveness of service (7.3), quality of technical support (6.9) and ease of use (6.9). It outscored its rivals comfortably in management of data traffic on modems and multiplexers (6.5). •

COMPUTERWORLD BUYERS' SCORECARD

LAN management software

Total scores reflect average user ratings for all measured areas, weighted by user-assigned importance. Response base: Openview: 34; Sunnet Manager: 24; Netview: 40

Product	Highest ratings	Lowest ratings
Hewlett-Packard's Openview SCORE 71	Responsiveness of vendor service Quality of technical support Ease of use	Ability to manage traffic on modems and multiplexers Security management Providing accounting information
Sun's Sunnet Manager SCORE 64	Value for the dollar Quality of technical support Graphical user interface capability	Ability to manage traffic on modems and multiplexers Training time required Ability to manage other vendors' equipment
IBM's Netview SCORE 61	Responsiveness of vendor service Ease of use Quality of technical support	Support for other vendors' SNMP extensions Ability to manage other vendors' equipment Security management

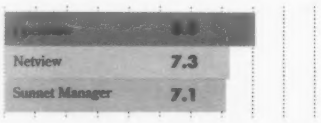
Total possible score 100
Mean score 65

KEY RATINGS

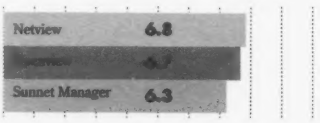
HP's Openview takes top honors in five of the six most important categories, according to users, including the No. 1 area of concern: responsiveness of vendor service. IBM's Netview places first in the remaining area, fault tolerance and troubleshooting, while earning second-place marks in three other areas.

User importance rating:

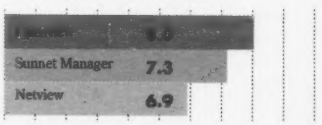
8.4 Responsiveness of vendor service



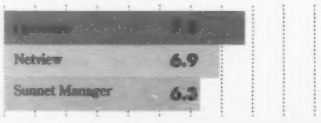
8.3 Fault tolerance and troubleshooting



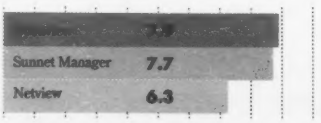
8.1 Quality of technical support



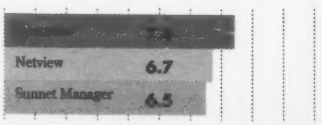
8.0 Overall ease of use



7.9 Value for the dollar



7.8 Ability to manage large networks

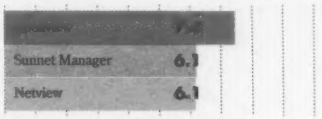


A CLOSER LOOK

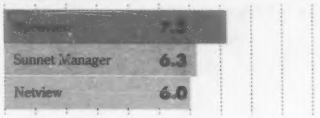
Sun's Sunnet Manager scored second-place finishes in six of 11 areas, tying for second in three others. Openview placed first in all categories but two.

User importance rating:

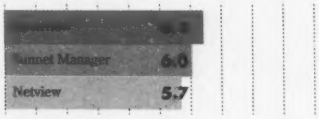
7.7 Configuration management



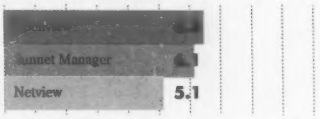
7.4 Ability to manage traffic across bridges and routers



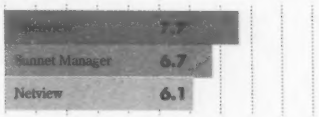
7.3 Performance management and capacity planning



7.3 Ability to manage other vendors' equipment

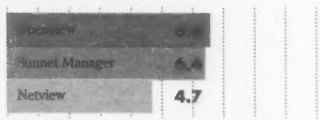


7.2 Mapping ability

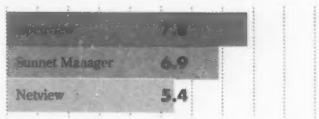


7.2 Training time required to use product

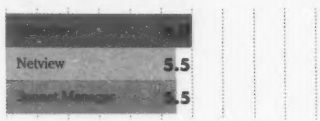
7.0 Support for other vendors' SNMP extensions



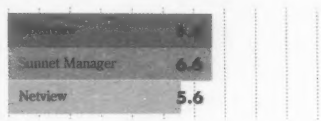
7.0 GUI capability



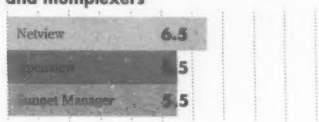
6.9 Security management



6.6 Providing accounting information



6.4 Ability to manage traffic on modems and multiplexers



Verbatim

What do you like best/least about this product?
(Responses are based on the most frequently stated answers)

Likes
Ease of use
Flexibility
Reliability

Dislikes
Poor service/support
Poor diagnostics
Lack of flexibility

Sunnet Manager

Likes
Ease of use
Low cost
Flexibility

Dislikes
Not user-friendly
Poor diagnostics
Difficult learning curve

Netview

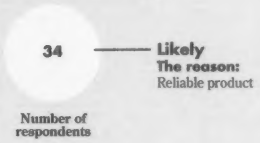
Likes
Flexibility
Had good experiences with it
Ease of use

Dislikes
Lack of flexibility
Not user-friendly
No graphical interface

Loyalties

How likely would you be to purchase this product again if you were making the decision today?
(Reasons based on most frequently stated responses)

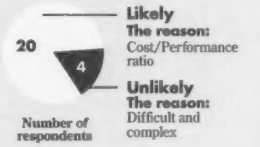
Response base: 34



Likely
The reason: Reliable product

Sunnet Manager

Response base: 24

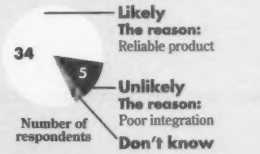


Likely
The reason: Cost/Performance ratio

Unlikely
The reason: Difficult and complex

Netview

Response base: 40



Likely
The reason: Reliable product

Unlikely
The reason: Poor integration

Don't know

Vital statistics

Total number of respondents: 98

What is your position?

Manager	61
Staff	18
Director	12
Other	7

How many years have you been using this product?

More than five years	8
Four to five	11
Two to three	37
One or less	42

What is your responsibility for LAN management?
(Multiple responses allowed)

Evaluate or recommend vendors	85
Set standards for organization	73
Determine need	71
Select vendors	69
Approve or authorize purchases	45
Establish purchase agreements with vendors	44
Buy for user departments	43

How many nodes are on the network managed by this product?

More than 500	15
401-500	4
301-400	0
201-300	7
101-200	19
51-100	16
1-50	32
No response	5

METHODOLOGY

To qualify for *Computerworld*'s Buyers' Scorecard on local-area network management, a product had to have more than 200 installed sites and be comparable in features and functions.

The survey was based on random samples of users drawn from nonvendor sources. The response base was 40 for IBM's Netview, 34 for Hewlett-Packard Co.'s Openview and 24 for Sun Microsystems, Inc.'s Sunnet Manager.

First Market Research in Austin, Texas, conducted the telephone survey and tabulated the results.

The total weighted scores were computed by multiplying the mean scores users assigned all criteria by the mean scores each user group gave its own product. Ratings are presented in order of importance based on these mean importance ratings.

WISH LIST

Respondents said they would like to see the following features added to their products:

- Openview: more flexibility to interface with other vendors, better diagnostics, better database capabilities and improved overall network management.
- Sunnet Manager: better database capabilities, better diagnostics and better overall management.
- Netview: more flexibility to interface with other vendors, graphical display capability, better diagnostics and better system upgrade capabilities.

Users said they obtain the following benefits from the products: easier diagnostics and troubleshooting, better ability to manage LANs and good user interface for LAN management.

One-third of the 98 respondents manage 90% to 100% of their LAN equipment through these products.

ACKNOWLEDGMENTS

Computerworld thanks the following individuals and companies for their assistance in preparing this Buyers' Scorecard: Jeff Case, SNMP Research, Inc.; Tom Dolan, Westcon, Inc.; Jill Huntington-Lee, Datapro Research Group; David Passmore, Ernst & Young Center for Information Technology and Strategy.

LAN inventory management products

VENDOR	PRODUCT	PRODUCT TYPE	COMPATIBLE NETWORKS	COMPONENTS INVENTORIED	CONFIGURATION MANAGEMENT FEATURES	IDENTIFIES SERVER-BASED PROBLEMS	HARDWARE REQUIRED	OPERATING SYSTEM REQUIRED	RAM REQUIRED (BYTES)	DISK SPACE REQUIRED (BYTES)	USER INTERFACE SUPPORTED	NETWORK INTERFACE SUPPORTED	PRODUCT IS USED IN BACKGROUND	RUNS CUSTOMIZED REPORTS	RUNS REPORTS SIMULTANEOUSLY	OTHER COMPATIBLE PRODUCTS FROM VENDOR	PRICE
AG Group, Inc. (510) 937-7900	Net Watchman	Inventory management, configuration management	Appletalk	CPU type, network addresses, software on the server and workstation, network software version number, driver versions	Tracks problems, highlights problem areas	No	Macintosh	Mac OS	1M	4M	GUI, mouse and icons	Ethernet, Token Ring, FDDI, Localtalk, all media carrying Appletalk	Yes	Yes	No	Etherpeek, Skyline/E, Localpeek	$195 (network version)
	Skyline/E	Configuration management	Novell Netware, all Ethernet-based networks	Network addresses, traffic flow over time	Traffic monitoring, alarms, archiving, pre- and postconfiguration tests	No	Macintosh	Mac OS	2M	User-defined	GUI, mouse and icons	Ethernet	Yes	Yes	No	Etherpeek, Localpeek, Net Watchman	$195 (network version)
	Localpeek	Configuration management	Appletalk	Network addresses, traffic flow and utilization, traffic alarms	Network utilization statistics by segment, traffic convention for testing, traffic alarms	Yes	Macintosh	Mac OS	1M	1M	GUI, mouse and icons	Localtalk	Yes	No	No	Etherpeek, Skyline/E, Net Watchman	$495 (network version)
	Etherpeek	Configuration management	Novell Netware, all Ethernet-based network	Network addresses, traffic flow, traffic alarms	Traffic configuration for testing, network utilization statistics by segment, traffic alarms, violations	NP	Macintosh	Mac OS	2M	1M	GUI, mouse and icons	Ethernet	Yes	No	No	Localpeek, Skyline/E, Net Watchman	$795 (network version)
Blue Lance, Inc. (713) 680-1187	LT Auditor 4.0	Inventory management, configuration management, audit trail	Novell Netware	CPU type, amount of memory and disk space, network addresses, network software version number, software on the server and workstation, user profiles, print queues, drive mappings, file access, LAN access, Novell Bindery modifications	Tracks Novell Bindery changes and workstation hardware configuration changes	Yes	IBM PCs and compatibles	DOS	10K (workstation)	1M (server)	GUI, character-based	Ethernet, TCP/IP, Token Ring, all Netware-compatible interfaces	Yes	Yes	Yes	LT Stat, LT Helpdesk	$695 per server
Brightwork Development, Inc. (908) 530-0440	LAN Automatic Inventory 2.0	Inventory management, configuration management	Novell Netware	CPU type, network addresses, software on the server and workstation, amount of memory, network software version number, user profiles, amount of disk space, BIOS information, type of hard drive and floppy	Macintosh and PC support, compiles data about hardware and software	No	IBM PCs and compatibles, Macintosh	DOS, Mac OS	200K	1M	All Novell-compatible user interfaces	Ethernet, Token Ring, Arcnet	Yes	Yes	No	LAN Support Center, Net-remote	$695 per server
CSG Technologies (412) 471-7170	Network Supervisor 2.0	Inventory management, configuration management, network management	Appletalk	CPU type, network addresses, software on the server and workstation, drive mappings, amount of memory, network software version number, user profiles, amount of disk space	Network control center, topology editor, alerts feature	Yes	Macintosh	Mac OS	2.5M	4M	Mouse and icons	Ethernet, Token Ring, Appletalk	Yes	Yes	No	Network Supervisor Jr., Network Supervisor 4-D developer kit	$495 for 25 users; $795 for 50 users; $995 for 75 users; $1,295 for 100 users or more
Frye Computer Systems, Inc. (617) 234-2700	LAN Directory Version 1.0	Inventory management, configuration management, troubleshooting, diagnostics	DOS-based PC network	CPU type, network addresses, software on the server and workstation, amount of memory, network software version number, amount of disk space	Customized reporting	Yes	IBM PCs and compatibles, Macintosh	DOS, Mac OS	640K	1M and above	Text-mode windowing system	Ethernet, TCP/IP, Token Ring, Novell Netware topology	Yes[3]	Yes	Yes	All Frye Utilities for Networks, Netware Management Version 1.1, Netware Early Warning System Version 1.1	$495 includes first 50 devices for workstations and servers; $395 for each additional 100 devices
Graphic Management Group, Inc. (914) 769-7800	The Graphic Net-Worker	Inventory management, configuration management	Novell Netware	CPU type, network addresses, software on the server and workstation, amount of memory, user profiles, cable routing, financial data	Integrated drawing, database	No	IBM PCs and compatibles	DOS, Mac OS	640K	4M	Mouse and icons	NA	No	Yes	No	Graphic Data Center Manager	$2,495 per node or server
Horizon's Technology, Inc. (619) 292-8320	LAN Auditor	Inventory management, configuration management	Novell Netware, Banyan Vines, Microsoft LAN Manager	CPU type, network addresses, amount of memory, network software version number, amount of disk space, installed cards, IRQ[2] status, AUTOEXEC.BAT, CONFIG.SYS	IRQ[2] status, AUTOEXEC.BAT, CONFIG.SYS, memory, hard disk, partitioning	No	IBM PCs and compatibles	DOS, Windows 3.0	640K (DOS), 2M (Windows)	5M	GUI, mouse and icons	Ethernet, Token Ring, Arcnet	Yes	Yes	No	None	$495 includes support for 50 PCs; $295 for each additional 100 PCs
IBM (800) 426-2468	IBM LAN Management Utilities/2	Inventory management, configuration management, operations, performance and fault management	IBM LAN Server	CPU type, network addresses, software on the server and workstation, drive mappings, amount of memory, network software version number, user profiles, amount of disk space, microchannel adapters	Relational database, change log, alert on change	No	IBM PCs and compatibles	DOS, OS/2	134K (DOS), 200K (OS/2)	1.2M (OS/2); 150K (DOS)	Command line, query manager	Ethernet, Token Ring	Yes	Yes	Yes	LAN Server, LAN Network Manager, OS/2 Extended Edition	$480 per server
Intel Corp. (801) 379-2200	LANsight Support Version 2.10	Inventory management, configuration management	Novell Netware	CPU type, network addresses, amount of memory, network software version number, user profiles, print queues, real-time network diagnostics, IPX/SPX statistics, workstation memory map	Remote control of the LAN	No	IBM PCs and compatibles	DOS	5K	260K	GUI, X Window, mouse and icons	All Netware-compatible interfaces	Yes	No	No	All	$395 per server
Macvonk USA (215) 660-0606	Netoctopus	Network administration tool	Novell Netware, Banyan Vines	CPU type, network addresses software on the server and workstation, amount of memory, network software version number, user profiles, amount of disk space, all files on a Macintosh	Install, delete, update files across the network, track hardware	Yes	Macintosh	Mac OS	1.5M	800K	GUI	Ethernet, Token Ring, Appletalk	Yes	Yes	Yes	Inforum, Handiworks, P.INK SQL	$645 (network version); $45 per node

[1]Under windows. [2]IRQ = interop requests. [3]Also identifies solutions.

Saber Software Corp., (214) 361-8086, which responded too late to appear in the chart, offers LAN Administration Architecture: Saber LAA Agent Toolkit ($695/server) and Saber LAA Console/RT ($495/user).

The companies included in this chart responded to a recent survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Contact vendor for further product information.

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VENDOR	PRODUCT	PRODUCT TYPE	COMPATIBLE NETWORKS	COMPONENTS INVENTORIED	CONFIGURATION MANAGEMENT FEATURES	IDENTIFIES SERVER-BASED PROBLEMS	HARDWARE REQUIRED	OPERATING SYSTEM REQUIRED	RAM REQUIRED (BYTES)	DISK SPACE REQUIRED (BYTES)	USER INTERFACE SUPPORTED	NETWORK INTERFACE SUPPORTED	PRODUCT IS USED IN BACKGROUND	RUNS CUSTOMIZED REPORTS	RUNS REPORTS SIMULTANEOUSLY	OTHER COMPATIBLE PRODUCTS FROM VENDOR	PRICE
Madge Networks Ltd. (800) 976-2343 (408) 441-1300	Ring Manager II	Inventory management, configuration management	Novell Netware, any Netbios Token Ring	Network addresses, software on the workstation, Novell Name, Netbios Name, Insert duration	Token Ring security, fault detection and prevention	No	IBM PCs and compatibles	DOS	640K	4M	GUI	Token Ring	Yes	Yes	Yes	Adapters and bridges	$3,995 (network version); $1,395 per node/server
Magee Enterprises, Inc. (404) 446-6611	Network H.Q.	Inventory management	Novell Netware, Microsoft LAN Manager, Banyan Vines, Hayes Lanstep	CPU type, network addresses, software on the server and workstation, amount of memory, network software version number, user profiles, amount of disk space	Collect workstation setup files, inventory software	No	IBM PCs and compatibles, Macintosh	DOS, Mac OS	100K (workstation), 300K (administrator)	900K	GUI	Any which the network operating system supports	No	Yes	No	None	$395 for 100 workstations; $795 for server for unlimited users
Netwave, Inc. (212) 242-3260	LANconfig	Configuration management	Novell Netware	Network addresses, software on the server and workstation, network software version number, user profiles, amount of disk space	Server configuration reporting, automatic station downloads	Yes[3]	IBM PCs and compatibles	DOS	512K	1M	Menu-driven mouse support	All Novell-compatible network interface cards	Yes	Yes	Yes	LANtrail, LANshadow, LANtrack	$495 per server
Network Monitoring, Inc. (408) 986-1166	SnapNET	Inventory management, configuration management	Any Windows-based network	Any information that can be free-form input into notepads	Build, display and track WAN/LAN layouts on U.S., North American or world map with ability to create databases	No	IBM PCs and compatibles	DOS, Windows 3.0	1M	2M	GUI, mouse and icons	Ethernet, TCP/IP	Yes	Yes	Yes	SnapPROBE	$495 per node
Newbridge Networks, Inc. (703) 834-3600	8001 SNMP Manager	Configuration management	Novell Netware, any Ethernet	Any SNMP variable	Sets and retrieves configuration information	No	IBM PCs and compatibles	DOS	640K	20M	Menu-driven	Ethernet, TCP/IP	No	No	No	8100 Router, 8230 Ethernet Bridge, 3600 Bandwidth Manager, 3604 Frad	$1,000
	5638 SNMP Manager	Configuration management	Novell Netware, any Ethernet	Any SNMP variable in any LAN device	Sets and retrieves configuration information	No	Unix workstation, Sun Sparc	Unix	16M	105M	GUI	Ethernet, TCP/IP	No	Yes	No	8100 Router, 8230 Ethernet Bridge, 3600 Bandwidth Manager, 3604 Frad	$5,000
On Technology, Inc. (617) 876-0500	Status*Mac	Configuration management	Any Appletalk-compatible network	CPU type, network addresses, software on the server and workstation, amount of memory, user profiles, amount of disk space	Peer-to-peer store-and-forward architecture, profiling options, user-controlled scans, built-in database manager, uses ADSP for network efficiency	No	Macintosh	Mac OS	2M	2M	Mouse and icons	Ethernet, Token Ring	Yes	Yes	Yes	Instant Update, Meeting Maker, On Location	$449 for 25 users; $1,199 for unlimited users per network manager
Preferred Systems, Inc. (203) 459-1115	Origen Version 1.3	Configuration management	Novell Netware	User profiles, user and group configuration, Netware, trustee rights, Netware security	Logical server configuration and documentation	No	IBM PCs and compatibles	DOS	640K	2M	GUI	All DOS-based Netware	No	No	No	Flagship product	$195 per server
Technology Works (800) 685-7464	Gracelan Update Manager	Configuration management	Appletalk	Software on the workstation	Updates software on end user machines	No	Macintosh	Mac OS	2M	1M	Mouse and icons	Ethernet, Token Ring, Localtalk	Yes	No	No	Other Gracelan products	$295, single user; $495, unlimited
	Gracelan Network Manager	Inventory management, configuration management	Appletalk	CPU type, network addresses, software on the server and workstation, drive mappings, amount of memory, network software version number, user profiles, amount of disk space, print queues	Provides a complete user profile of hardware, software	No	Macintosh	Mac OS	1M	1M	Mouse and icons	Ethernet, Token Ring, Localtalk	Yes	No	No	Other Gracelan products	$495 for 50 users
	Gracelan Network Help	Configuration management	Appletalk	CPU type, amount of memory, network software version number, user profiles, amount of disk space, software on the workstation	Rule-based system to detect problems or conflicts on end user machines, suggests solutions	No	Macintosh	Mac OS	1M	3M	Mouse and icons	Ethernet, Token Ring, Localtalk	Yes	Yes	No	Other Gracelan products	$495 for 50 users; $1,195 for unlimited users
	Gracelan Assets Manager	Inventory management, configuration management	Appletalk	CPU type, network addresses, software on the server and workstation, drive mappings, amount of memory, network software version number, user profiles, amount of disk space	Provides a central storage facility fo hardware and software inventory details	No	Macintosh	Mac OS	2.5M	8M	Mouse and icons	Ethernet, Token Ring, Localtalk	Yes	Yes	No	Other Gracelan products	$895 (network version)
Touchstone Software Corp. (714) 969-7746 (800) 531-0450	Check It LAN	Inventory management	Novell Netware	CPU type, network addresses, software on the server and workstation, amount of memory, network software version number, amount of disk space, workstation virus scan, workstation diagnostics, workstation hardware inventory, IRQs on workstation	Remotely checks IPX, NETX, DOS versions on workstation	No	IBM PCs and compatibles	DOS	512K (workstation)	6M	DOS text mode	Ethernet, Token Ring, any Netware-compatible interface	Yes	Yes	No	PC Test	$249 for five nodes; $495 for 20 nodes; $995 for 50 nodes; $1,295 for 100 nodes; $1,995 for 250 nodes
Triticom (612) 937-0772	Argus/n	Inventory management, configuration management, remote control	Novell Netware	CPU type, network addresses, amount of memory, network software version number, user profiles, amount of disk space	Real-time and database comparisons	No	IBM PCs and compatibles	DOS	580K	500K	Menu-driven	Ethernet TCP/IP, Token Ring	No	Yes	No	Ethervision, Arcvision, Tokenvision	$245 (single network version); $645 (internetwork version)
Visisoft (404) 874-0428	Visinet	Inventory management, configuration management, server and workstation monitoring	Novell Netware, LAN Manager, Netbios-compatible LANs	CPU type, network addresses, drive mapping, amount of memory, network software version number, user profiles, amount of disk space, software on the workstation, print queues, up to 400 fields of hardware, software and firmware	Maintains hardware, software, firmware by PC	Yes	IBM PCs and compatibles	OS/2, Windows 3.0	2M	3M	GUI, mouse and icons, Windows 3.0, Presentation Manager	Ethernet, TCP/IP, Token Ring, SNMP	Yes	Yes	Yes	None	$1,995 (network version)

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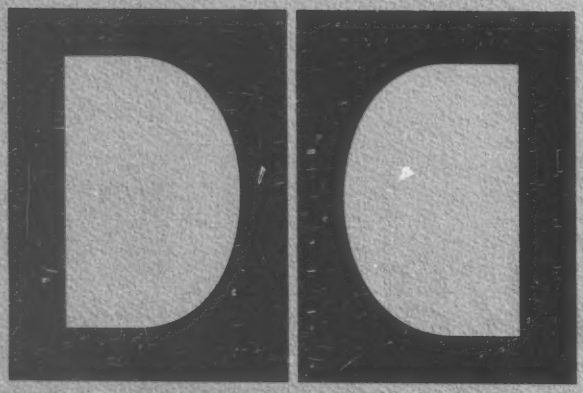

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Getting to know U(sers)

A quick quiz can reveal the depths of understanding — or misunderstanding — between users and IS

Santiago Cohen

BY DENNIS VANVICK

The relationship between the information systems staff and the user community can be likened to an arranged marriage: Neither party asked for the union, but both must live with it.

Until that day of bliss when IS and users will live in complete, integrated, cross-functional harmony, there are going to be some interactions that will make sparks fly. No matter how much lip service is paid to the notion that the data belongs to the users, there still exists in many IS shops an "us against them" mentality. Why? Is a simple misunderstanding of roles the cause of the problem?

In many cases, yes. User managers often view IS departments as a black hole into which they pour their profits, with little business results. They don't get their systems on time, and they don't understand how the IS department works. IS managers look at functional departments as demanding too much too soon without a complete appreciation of the role IS plays in the firm. They can't get their systems out on time, and they don't understand how the user department works.

Even small misunderstandings can lead to poor communication and bad blood between the two groups. Such acrimony can damage the functioning of the corporation. For example, without synergy, a development project can go over budget and cause the firm to miss a key business opportunity.

As the IS manager, you have to spearhead efforts to increase understanding of one another. Don't wait until things get bad; take action regarding the IS/user relationship before it goes sour.

Finger-pointing and personal attacks not only are unprofessional but also get you nowhere, so you'll need to find other ways to determine whether there is cooperation or disunity in your company. One nonthreatening way to do this is to give IS and user staffs an informal test to gauge the depth of the problem in your organization.

The basic premise of the test is to present a series of typical dialogues between users and IS, asking those taking the quiz to indicate which party they sympathize with and why. What they answer will hopefully show their understanding of the sometimes contentious but always symbiotic IS/user relationship. (See quiz instructions below.)

Don't forget to take the quiz yourself. You'll want to gather the answers and use the findings as a starting point for a meeting between IS and users. The goal is to get problems into the open and correct them.

Please keep in mind that this is not an all-encompassing study and is written by an IS person. While bias may be embedded in the questions or answers to this quiz, it honestly attempts to be objective.

Roll up your sleeves and dig in:

QUIZ INSTRUCTIONS

1. Interpret each statement as a stand-alone situation. There is no relationship among the various scenarios.
2. If the statement is not relevant to your environment, simply skip it. Your score will not be affected.
3. Answer each question according to this scale: I sympathize . . .
   A. With the user **B.** With IS **C.** With both **D.** With neither
4. Circle only one answer per question.
5. Compare your answers with the key at the end of the quiz, and determine your score and rating.

SCENARIO 1

User manager: Our chargeback expenses are astronomical. Sky-high salaries on the IS side don't help the situation.

IS manager: I'm sorry you feel that way, but our salaries are market-driven. We pay the salaries we have to pay to attract good people — as your department does. We should sit down and discuss your chargeback expenses. They are based on the time that our people and hardware devote to your priorities.

Circle an answer: I sympathize. . .
A. With the user **B.** With IS
C. With both **D.** With neither

Continued from page 103

SCENARIO 2

User manager: System development time is always quite a bit more than you estimate. Why? Why can't we ever get a system on time? What are we doing wrong?

IS manager: It's simple — you are continually changing requirements. The system we are developing today is not the same as the system we began developing last month. You have to be more careful at the front end in gathering systems requirements. The more time you spend gathering requirements for the system, the less time it will take to code, test and maintain the system.

Circle an answer: I sympathize . . .
A. With the user **B.** With IS
C. With both **D.** With neither

SCENARIO 3

User manager: You and your machine are an expensive burden to the corporation. You don't produce revenue — only expense.

IS manager: C'mon, you know better than that. We are the nerve center of the company. We provide a valuable resource to the company — information.

Circle an answer: I sympathize . . .
A. With the user **B.** With IS
C. With both **D.** With neither

SCENARIO 4

User manager: Our response time is terrible! Screen-to-screen response time averages about 10 seconds. It's unacceptable for our business.

IS manager: Of course — there are too many users on the system. Either we restrict the number of users, or you will have to stagger the work hours of your people to lessen the load on the system.

Circle an answer: I sympathize . . .
A. With the user **B.** With IS
C. With both **D.** With neither

SCENARIO 5

User manager: Instead of waiting for the new system, we've purchased a personal computer package and are going ahead with implementation plans. The package meets our needs perfectly. We won't have to bother you at all.

IS manager: That's fine with us as long as you don't need any help from us.

Circle an answer: I sympathize . . .
A. With the user **B.** With IS
C. With both **D.** With neither

SCENARIO 6

User manager: We need your staff to perform a small modification to the open purchase order inquiry display.

IS manager: It's going to take a long time. The programmer who wrote that particular program left the company, and no one else understands it very well.

Circle an answer: I sympathize . . .
A. With the user **B.** With IS
C. With both **D.** With neither

SCENARIO 7

User manager. Your department should report to the chief executive officer. IS reporting to the financial manager is an archaic structure and has caused a lot of problems. Let's face it — you have a vested interest in providing super support to finance and putting the rest of us on hold. You should report to the CEO, the same as I do.

IS manager: You put me in a difficult position and one that I don't have the power to change. Why don't you talk to the CEO?

Circle an answer: I sympathize . . .
A. With the user **B.** With IS
C. With both **D.** With neither

SCENARIO 8

User manager: The CEO tells me IS will not approve the purchase of any equipment other than IBM's. What is the reason for this? We want to buy Hewlett-Packard Co. printers because they are much quieter than IBM's.

IS manager: In the interest of uniformity and standardization, we want all the computer equipment in the company to come from one vendor. The uniformity simplifies billing, maintenance and support. Besides, IBM is the largest computer company in the world. IBM is a "safe" purchase.

Circle an answer: I sympathize . . .
A. With the user **B.** With IS
C. With both **D.** With neither

SCENARIO 9

User manager: IS never meets its deadlines.

IS manager: That's because you set them based on your needs, with no regard for our available resources. We should have the freedom to set our own schedules.

Circle an answer: I sympathize . . .
A. With the user **B.** With IS
C. With both **D.** With neither

SCENARIO 10

User manager: We've been looking at ways to move up the target date on our marketing software project and want to talk to you about the possibility of deferring much of the user documentation until after implementation. This way, you can shift the people who are doing the user documentation over to coding. My employees can critique and add to the documentation after we go live.

IS manager: We think the user documentation should be written as we progress with the system. We feel strongly about this and will argue for an extension of the target date before we agree to defer the documentation. We can still plan on a critique and modifications by your staff. In fact, we encourage it.

Circle an answer: I sympathize . . .
A. With the user **B.** With IS
C. With both **D.** With neither

.....

If participants come back from taking this quiz and their eyes aren't bloodshot or their fists clenched, take that as a good sign. Now, here's how you and the other test takers should have responded and why:

Scenario 1: B. Give the information systems manager points for a factual and empathetic response. The user should not bring up salaries as a point of contention. That is more of a personal attack than a valid point.

The real issue is the chargeback costs, and the IS manager's offer of explaining how chargeback works is a start in solving this conflict.

Having an inaccurate and therefore inequitable chargeback system will frustrate users and damage IS' relationship with them.

To obtain buy-in and increase IS credibility, you should involve users in the development of a chargeback package. They should be given access and an explanation about the amount they are billed.

Scenario 2: B. or **C.** Both departments should shoulder blame for incomplete requirements gathering because it is a joint responsibility. Possible points to the user manager here because in asking what his group is doing wrong, he is at least taking some of the responsibility for the problem.

More time should be spent on the front end of the systems development cycle, and once the IS group recognizes this fact, it should convince the user community of it as well. Studies have shown that it takes one hour to correct a bug in the design phase and approximately eight hours to correct a bug in the postimplementation phase.

Can users afford to wait a full day while you fix a payroll processing application that has come down with a bug? You have to help users understand the importance of front-end investment in terms of time and cost.

Scenario 3: B. Maybe the idea of IS as the "nerve center" is a bit much, but information is a valuable resource, and the user is too antagonistic in presenting his case here.

The fact remains, however, that if the information systems department was doing its job — providing accurate, immediate information so that the user could do his work — then users would regard it as a key function. Providing better decision-making impacts the bottom line and turns IS from revenue drain to revenue enhancer.

Scenario 4: A. Ten-second screen-to-screen response time is intolerable, and the user has a right to be rankled. Here, the IS manager's response is not at all analytical. He puts all the blame and the burden of a solution on the user, without any offer to analyze or help with the problem. The IS manager should listen to the user's plight — poor response time prevents people from doing their jobs, for which they are held responsible. The user is in crisis here, and his problem should be addressed immediately and efficiently. Think of how that will improve your image with users companywide.

Scenario 5: D. Maybe this is a trick question. The user is so obviously at fault for making purchasing plans without consulting IS that it may overshadow IS' shortcoming. IS is too readily willing to accept the fact that users are forging ahead on their own without investigation into what such autonomy would mean. Think how crazy things could get if users start needing interfaces or add-ons or support for systems they selected without IS input.

A cross-functional management steering committee is an expedient setup that keeps IS apprised of what users are doing and gives users some flexibility in hiring contractors or purchasing certain third-party software. The committee could police these types of purchases, including gauging what kind of installation, troubleshooting and follow-up support might be required.

Scenario 6: A. The fact that the departure of a programmer has left the IS staff in such a precarious position, unable to meet the needs of users and, by extension, the company, indicates that there is a deeper, more serious problem here. There may be poor documentation and control through the entire system or the entire department, with little sharing of knowledge and few people in on the big picture.

The wonder in a company like this is how any systems got implemented at all or how any of them are useful to the business. If the IS chief has inherited this mess, he should immediately start an investigation of poor documentation to correct the problem. In a situation as dire as this one, there's no time to waste.

Scenario 7: B. The IS manager's corporate protocol is above reproach. Reporting structure is not something he should be discussing with the user manager. However, if the user is unhappy because he feels support is inequitable, the IS manager has to deal with that resentment, perhaps even by suggesting to his superiors a change in the reporting structure.

It may be better for the information systems department to report to a committee of functional managers to avoid any appearance of bias.

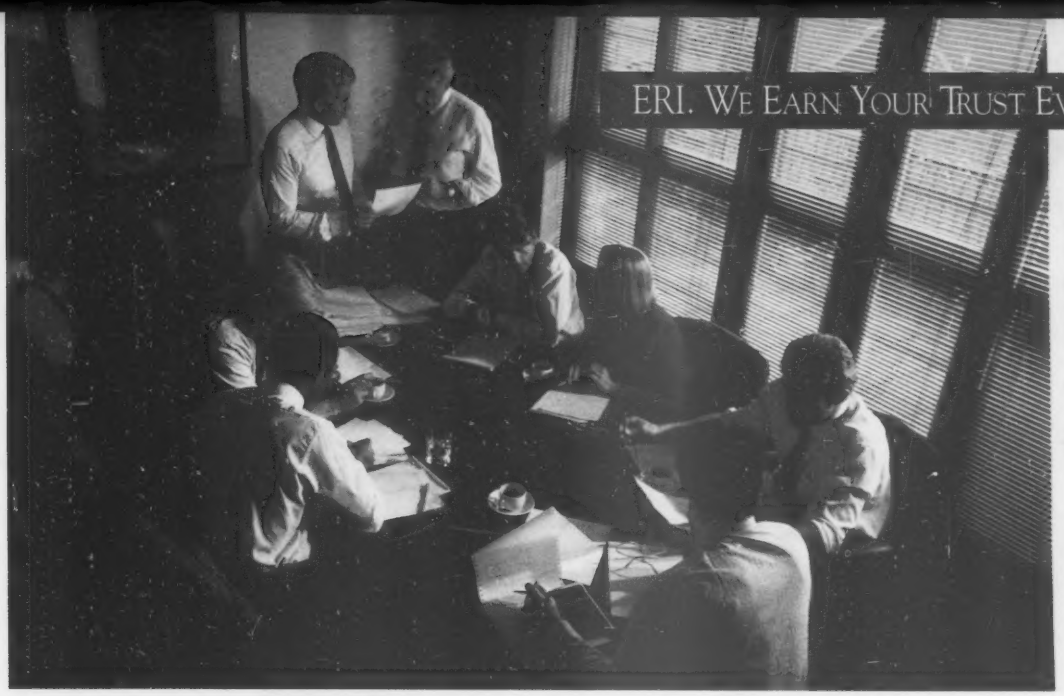
If the reporting structure cannot be changed, it may be worth working with the finance department to set up a system in which IS addresses department needs by standards such as timeliness, strategic importance and availability of IS staff. The IS manager should make this priority list freely available.

Scenario 8: A. This is an antiquated, illogical mentality — vintage 1960s, when "you couldn't get fired for buying IBM." An IS manager who responds in this manner will soon be left behind — or without a job.

Simplifying information systems billing, maintenance and support are not reasons to put a system in.

The overriding factor should be what is best for your users and your business,

Continued on page 107



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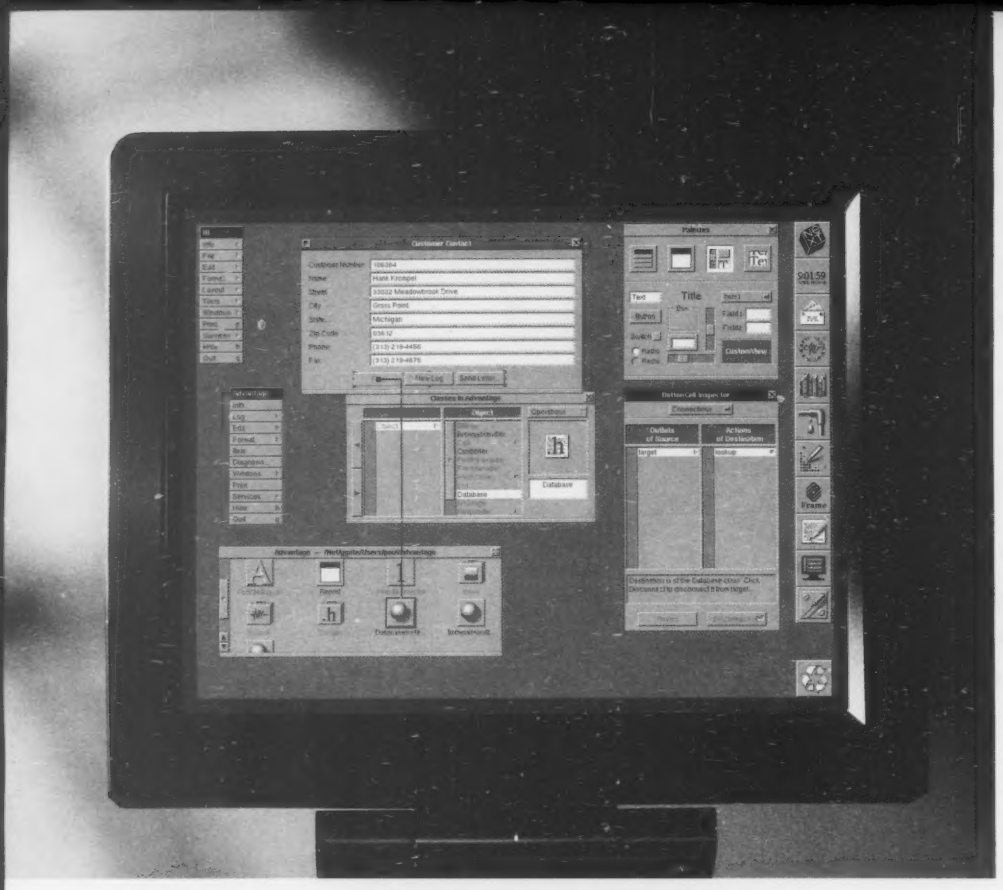

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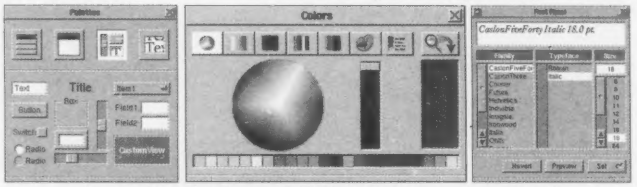

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Continued from page 104

within your budget limitations.

This IS chief must have been in hibernation for at least the last decade. Otherwise, he might have heard that uniformity is no longer the domain of proprietary systems.

Many technologies enable multivendor, heterogeneous connections. Putting in place an evaluation system that includes a variety of vendors could help this relationship immensely.

Risky business

How can misconceptions between information systems staff members and users be taken care of?

Here's what some IS thinkers say:

Increase contact between warring parties. Stereotypes persist because of ignorance. Dispersion — the act of putting IS people closer to their clients — is one way to improve a bad situation.

At one company we studied in which the IS/user situation was particularly bad, IS was moved into the business unit. Perceptions changed. In fact, one senior business manager said, "You know what's interesting about the IS guys? They tend to be really smart."

Not only do stereotypes disappear, but IS is often valued for its ability. We've found that in dispersed companies, there's a marked increase in IS movement from the technical end into business positions.

Thomas Lodahl
Cognitech Services Corp.
Easton, Conn.

Develop an integrated methodology for doing IS work in the organization. This plan goes something like this:

- Make sure IS staffers understand they do client-based work.
- Qualify the client. Develop a full range of background on the business group you're working with. Know its basic computer competence level. Know its business and how workers can do it better.
- Do not deal with any problem in isolation. Three levels of development must happen concurrently for good IS/user relations: people development, business development and technology development.
- Operate as if no project is ever completed. Stay close to the user at all times.
- Develop a climate for change. Set up a process of continual evaluation, recommendation, development and upgrades for both "human" and technical systems.

Vicki McConnell and Karl Koch
Co-authors
Computerizing the Corporation: The Intimate Link Between People and Machines (Van Nostrand Reinhold, New York, 1990)

Scenario 9: D. It is difficult to sympathize with either party here. Why isn't the IS department setting its own priorities and schedule?

The formation of a steering committee made up of user department heads, the CEO and the information systems manager could improve the interaction between users and IS.

This committee could determine overall IS priorities as they apply to the business. IS could then assign staff and technology resources to take care of those priorities as well as report scheduled milestones back to the committee. No one would be surprised by missed target dates because IS would keep a record of why a date was missed.

Scenario 10: B. The IS manager gets the vote because he realizes that documentation is lost, forgotten or never completed if not dealt with in an ongoing fashion.

.....

The scenarios presented in this piece are certainly not meant to be an exhaustive representation of problems between users and IS departments, but they'll clue you in to some major areas of misunderstanding.

By knowing what to expect — and how to make your relationship with users a more open, productive one — you can develop harmony in your union. •

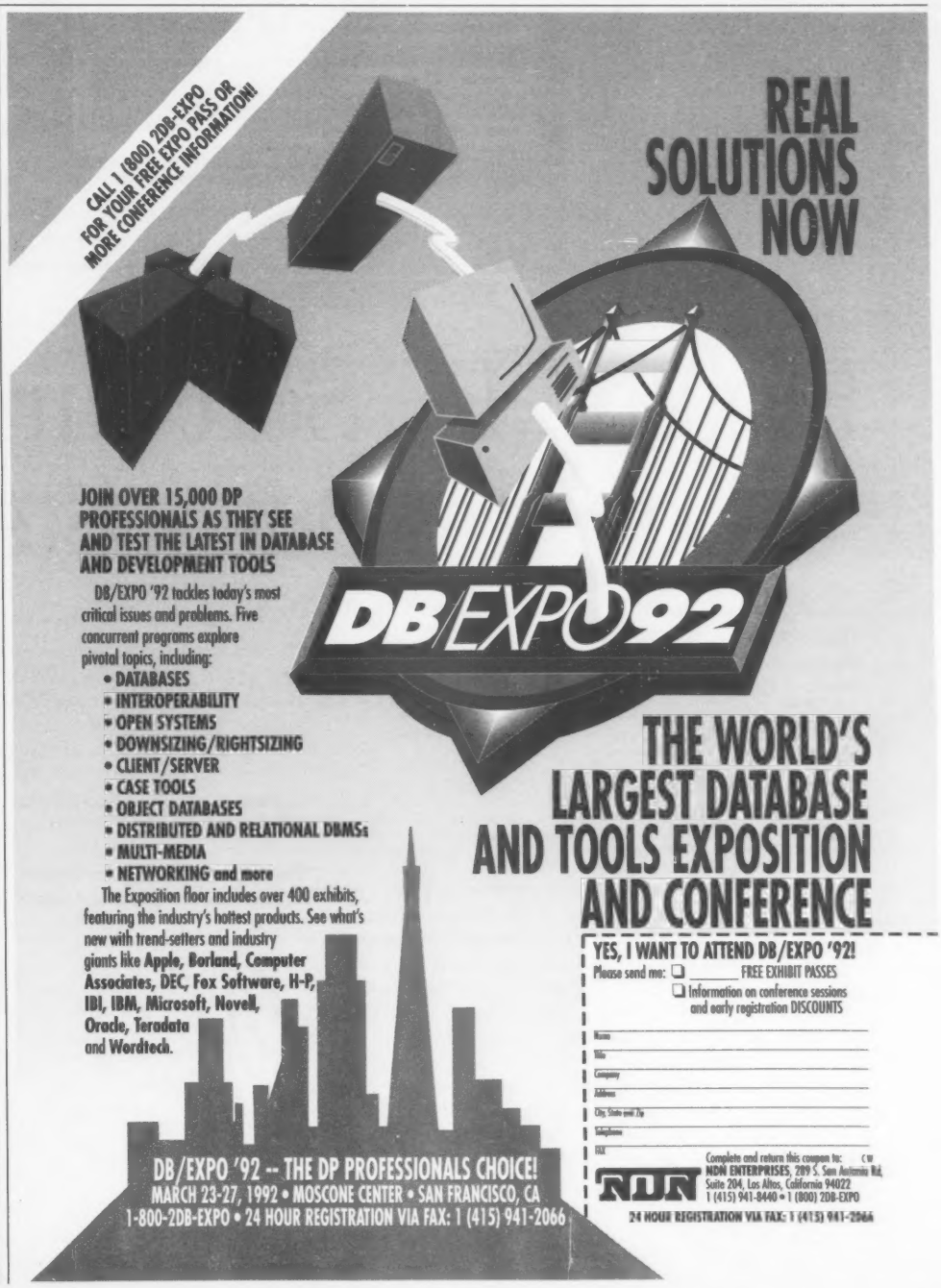
Vanvick is lead analyst of information systems and data processing at 3M International Operations in St. Paul, Minn.

QUIZ SCORING

To score the quiz, divide the total number of correct answers by the total number of questions answered to get a percentage.

90% to 100%	an excellent handle on the problem
80% to 89%	good
65% to 79%	fair
0% to 64%	poor

IS respondents with a poor score get one week in a user-re-education camp where acronyms are prohibited. User managers get one week in an IS re-education camp where acronyms are the only means of communication.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NATIONAL
BRIEFS

Ups and downs

▶ The mainframe, midrange systems and personal computer segments of the computer industry declined the most in revenue during 1991, according to a worldwide computer system market share survey completed by San Jose, Calif.-based **Dataquest, Inc.** What's left? Try workstations: With 14.5% 1991 growth, the often Unix-driven, open systems-oriented speedsters are the frequent fliers of the computer industry, according to Dataquest.

Ready for prime time

▶ Industry observers who have noted that a new era of vigilance in financial matters might also mean a new level of attention paid to accountants will find some support for their theory in the agenda for the **Information Technology Association of America**'s spring conference. The software industry association formerly known as **Adapso** will feature **CFO Day**: a first-time, all-day program for chief financial officers of software companies.

Sterling consolidates

▶ In search of gains in efficiency and effectiveness, **Sterling Software, Inc.** consolidated operations at two of its 14 divisions, merging the Dylakor and the Answer Systems Divisions. Sterling, a $224.4 million software company, has pursued a growth-by-acquisitions strategy since the early 1980s.

Filenet imaging stays ahead of pack

BY ELLIS BOOKER
CW STAFF

COSTA MESA, Calif. — Once upon a time Filenet Corp. was a scrappy little up-and-comer getting its feet wet in the promising new document imaging market. Today, said Ted Smith, Filenet's founder, president and chief executive officer, the market is no longer "the coming thing" — it's here. And Filenet, according to analysts, has arrived as well.

"I see a lot of signs, large and small, that [imaging] is a broadly recognized systems-level technology," Smith said. Unlike in the early days, when he was a traveling apostle of the concept, "a lot of companies now have a corporatewide imaging plan in place or under development."

Indeed, when Smith began selling document imaging systems in the mid-1980s, the imaging marketplace amounted to a handful of pioneering vendors and their equally pioneering customers. It was an exciting time, when vendor and user alike experimented, refined and assessed the benefits of converting a paper document into an electronic representation stored on an optical disc.

No more. IDC/Avante Technology, a market research and consulting firm in Framingham, Mass., said the imaging marketplace, although dampened by the recession last year, could double to $1.9 billion by the end of 1992.

For pioneer Filenet, the surge in user awareness has brought with it competition — and lots of it.

Along with independent firms such as Filenet, the leading computer companies — sensing an immense opportunity — have one after another joined the fray.

Continued on page 110

Portrait of a contender

It is often said that you can spot the pioneers by the arrows in their backs — but imaging systems pioneer Filenet has little at its back but the breeze

- **Company:** Filenet Corp.
- **Headquarters:** Costa Mesa, Calif.
- **Founded:** 1982.
- **President, CEO and founder:** Ted Smith.
- **1991 revenue:** $122.5 million, a 19% year-over-year increase (est.)
- **1991 net income:** $8.1 million, a 113% year-over-year increase.
- **Customer base:** Approximately 500 installations with some 350 customers since 1985. Banks and insurance companies are its largest industry by revenue.

Source: Filenet Corp. CW Chart: Janell Genovese

Q4 earnings continue to map ups and downs of hard times

Fourth-quarter earnings reports posted by computer industry firms last week continued to reflect the now-familiar themes of doing business at the crossroads of an economic recession and a technological revolution:

- Restructuring costs hammered Ameritech Corp.'s fourth-quarter profit down 31% from the $287 million net income logged in last year's comparable period.
- The first financial fruits of Computer Sciences Corp.'s $3 billion debut in the commercial outsourcing arena boosted the firm's revenue, while the recession's spread across Europe dragged its quarterly net income 3% below last year's fourth-quarter profit line.
- A light at the end of the costly restructuring tunnel shone from Computer Associates International, Inc. Its cost-containment efforts behind it, analysts said, the software giant posted its strongest single quarter yet. CA's surging revenue and profit, CA President Anthony Wang said, was delivered by strong sales across product lines and geographical bounds.
- In Stamford, Conn., IBM finance and leasing subsidiary IBM Credit Corp. (ICC) found the boisterous 1991 results that evaded its beleaguered parent: ICC posted annual net income of $200 million, up 21% over last year, on an asset portfolio increased 2% to $11.3 billion.

NELL MARGOLIS

Fourth-quarter 1991 earnings*

Company	Revenue Oct. to Dec. 1991	Percent change from 1990	Profit Oct. to Dec. 1991	Percent change from 1990
Ameritech Corp.	$2.74B	1.8%	$199.2M	(31%)
AST Research, Inc.	$239.1M	48%	$16.7M	2.5%
BMC Software, Inc.	$49.73M	50%	$13.21M	125%
Computer Associates International, Inc.	$455.1M	19%	$76.17M	20%
Computer Sciences Corp.	$544.6M	25%	$16.1M	(3%)
Legent Corp.	$56.25M	9%	$12.04M	24%
SHL Systemhouse, Inc.	$184M	4%	$2M	(56%)
Software Publishing Corp.	$41.11M	(4%)	4.1M	(37%)

*Parentheses indicate a reduction or loss

CW Chart: Michael Siggins

$ 6,230,769,248

By the end of this week
Computerworld readers will have spent
over $6.2 Billion on
Information Technology — representing nearly half of
all spending in the last seven days.

COMPUTERWORLD
The Newspaper of IS

Source: IDG Research Services, Fall 1991

Filenet imaging stays ahead of the pack

CONTINUED FROM PAGE 109

Systems integrators and consultants, likewise, are in on the action, with whole practices devoted to imaging.

Part of the change, according to Smith, has been a growing receptivity to the value of imaging on the part of data processing departments that once failed to acknowledge there was a "paper problem" in their companies.

"We once went to the [information systems] vice president of a major credit-card company and he said there was no paper problem," Smith said.

"On the other hand, the departmental management saw the piles of paper and what their people were dealing with," he said. This disparity has been a constant in his customer profiles, said Smith: More often than not, it is the user department that sponsors an imaging project.

Compelling concept

What IS managers could understand, however, was Filenet's Workflo software, a set of software modules that automate the trafficking of text and images between people, applications and devices in an enterprise. Indeed, the concept has been so compelling that it has become a generic term: A number of imaging vendors now offer work-flow software.

Rich Edwards, a senior analyst at Robertson, Stephens & Co., a San Francisco investment bank and market research firm, said a number of imaging vendors missed the point that managing digitized images, storing them to disc and displaying them on a screen is only the lowest level of the technology. "On top of that, you need applications to apply to business problems," he said. This, he added, is where Filenet's Workflo fits in.

Bruce Silver, director of image management systems at BIS Strategic Decisions in Norwell, Mass., put it this way: "You have to give Filenet the credit for a) inventing the concept and b) having the best software to do it." Silver and others also credit Filenet for deciding, in January 1991, to offer Workflo under MS-DOS and Microsoft Corp.'s Windows, giving users the important option of using standard personal computers rather than Unix workstations.

An intriguing question is whether Filenet could market Workflo independent of imaging. Most analysts think not — at least not now. First, several analysts said, while Smith's company has moved quickly in the direction of becoming a software vendor and away from its historic roots as a maker of proprietary hardware systems, hardware sales still account for 80% of its revenue (down from 95% in the first quarter of 1990). Second, a client/server work-flow product would require distribution and marketing muscle that Filenet does not have.

A final impediment is that Filenet "is actually lagging in the area of graphical tools for end users," Silver said. "For them to get into [the mass-market work-flow arena] they'd need an end-user tool set to complement what they have on the server." No firm has yet "locked up" the mass-market work-flow market, he said.

And the winner is?

The market for high-end imaging systems — those priced at more than $500,000 — is dominated by Filenet, IBM and Wang Laboratories, Inc.

- Filenet is believed to have installed the largest number of systems — more than 460 — but is behind IBM in terms of revenue. It won both the 1990 and 1991 Association for Information and Image Management/Datapro customer satisfaction surveys.
- IBM does not break out imaging as an independent product category; however, it is widely believed to have passed the $1 billion sales mark in 1991.
- Wang is a pioneer among the systems companies in the area of document imaging. However, its well-documented financial woes have reduced its competitive threat, according to analysts.

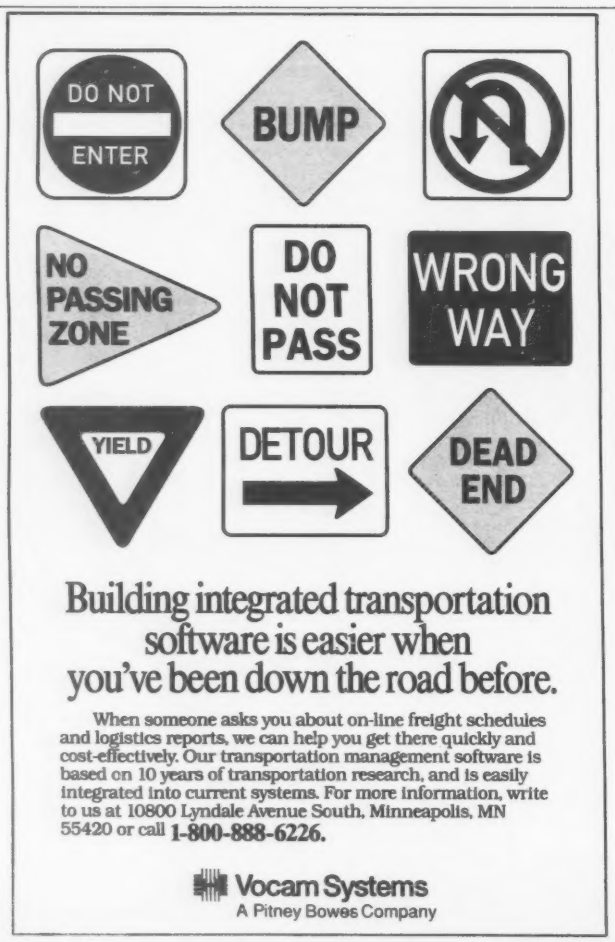
Moreover, analysts expect to see disruptions as Wang migrates its hardware base to IBM platforms; the firm's current imaging customers use the Wang VS minicomputer.

All three companies have products geared toward "production" applications, such as the processing of insurance claims or accounts-payable invoices. Filenet Chief Executive Officer Ted Smith acknowledged the role of imaging for office automation and what he called "personal business support" tools; however, he said he believes the technology's major growth will be in the production-oriented area, where the economic payoffs are easier to justify to management.

What of IBM? Bruce Silver, BIS Strategic Decision's director of image management systems, said IBM will become a more prominent imaging vendor as the Fortune 500 looks to add imaging to overall IS plans. This could be worrisome to Filenet. "As time goes on," Silver said, "they're going to find themselves [marketing] to end users when procurement decisions will be made higher up."

Smith acknowledged that computer vendors in general, and IBM in particular, will be "the principal players, along with a few independents like Filenet," in the imaging marketplace. In view of the huge market projected overall, he said, the prospect of IBM seizing a sizable part "doesn't keep me up at night."

ELLIS BOOKER



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INTERNATIONAL BRIEFS

Promising news

▶ **The People's Republic of China,** one of the most flagrant violators of U.S. software copyright law, signed an agreement pledging to protect software as literary works. In a memorandum of understanding, China said it will formally join the **Berne Copyright Convention** — effective Oct. 15, 1992 — and will protect U.S. copyrighted works within 60 days. The U.S. had threatened China with trade sanctions under Section 301 provisions of U.S. trade law if it did not act to curb software piracy.

Open society

▶ Highly placed backers in government and industry have joined forces to create a society for open systems, **Stowarzyszenie Systemow Otwartych,** in Poland, according to a recent report in the Polish business press. The founding committee, according to the report, includes among others the information technology director at Poland's Council of Ministers.

Better days

▶ **Siemens-Nixdorf Informationssysteme AG** said group sales in the first quarter of its 1991-1992 fiscal year rose 21% to $1.6 billion, according to a recent report in the French financial press. The company also said new orders for the first quarter — October through December — rose 20% to $1.7 billion. No year-to-year comparisons were supplied, according to the report, since Siemens-Nixdorf does not usually report its quarterly earnings.

Being there

▶ **Picturetel Corp.,** a player in the growing market for video compression-based visual telecommunications, will soon be selling and servicing its dial-up videoconferencing systems through its own subsidiary in Japan. Capitalized at approximately $78 million, the recently created **Picturetel Japan K.K.** will work in concert with its Peabody, Mass.-based parent company's current Japanese representative, Kyocera Corp.

Manila chips

▶ Integrated chip design in The Philippines is in for a boost this year as local semiconductor assembler **Integrated Microelectronics, Inc.** (IMI) gears up for a joint venture with Hong Kong- and U.S.-based parnters. IMI, a subsidiary of real estate conglomerate Ayala Corp., is in negotiations with **Valance Semiconductor Hong Kong, Ltd.** and Milpitas, Calif.-based **LSI Logic Corp.,** company officials told *Computerworld* Philippines last week.

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For start-up, $2 million is Serius money

BY JIM NASH
CW STAFF

SALT LAKE CITY — Like the saline waters of the Great Salt Lake edging ever nearer to this mountain city, interest in object-oriented software continues to rise slowly, almost unnoticeably — but steadily, nonetheless. Earlier this month, evidence of object technology's rising tide surfaced when tiny Serius Corp. announced that it had received $2 million in equity capital from an investor group led by networking giant Novell, Inc. A 3-year-old privately held company, Serius makes a library of software objects that substitute for hundreds of lines of code within larger programs that run on Apple Computer, Inc. Macintosh computers.

Novell ponied up $700,000, according to a Serius spokeswoman. The rest of the $2 million came from Los Altos, Calif.-based venture capitalist Crosspoint Venture Partners and Intermetrics, Inc., a Boston developer of defense-related Unix software. By computer industry standards, $2 million is minuscule. But it is twice the amount analysts estimate Serius made in product sales last year.

"Serius is raising software development away from code," said Joe Firmage, Serius' founder and chief executive officer. By enabling programmers to more easily create their own software, Firmage said he hopes to "give canned software stiff competition." Today, the company markets Serius Programmer 3.0 and Serius Developer 3.0.

Together, the two products offer 48 objects and 350 programming functions. The objects vary from window-building and animation routines to entire generic databases and spreadsheets. They also enable users to define objects of their own. A Microsoft Corp. Windows version is under development, Firmage said.

"We don't know of anyone else doing what Serius is doing," said Bob Hoff, general partner at Crosspoint. Hoff said object-oriented technology is evolving into commercially viable goods that will eventually move from programmers' workstations out to end users' desktops.

Destiny calls

Object-oriented software is destined to play a larger role both in how Novell builds its own software products and in the operation of the products themselves. The firm has said object orientation will become an intricate part of future Novell products. With Novell's money came an agreement that Serius would make objects compatible with Novell's Netware network operating system.

Part of Serius' long-range plans is to make all of its objects operating system-independent. Each object will inherently have the code to graft itself onto many or all major operating systems, Firmage said. DOS-based Netware is eventually expected to run on any operating system, Novell executives said. Firmage said Serius has been enlisted in that effort.

As for Intermetrics' appetite for investing in Serius, Firmage acknowledged initial surprise. The defense contractor also invested $1 million a year ago. "That was interesting to us," he said. Firmage said he has since learned that "Intermetrics has been looking to get out of government contracts, and object-oriented programming is one alternative."

Charlotte Walker, an analyst at Martin Simpson & Co., said she sees object-oriented software and expert systems technology as descendants of the artificial intelligence movement. It is the next step in automating the construction of programs as well as the operation of computers, Walker said.

Simply stated, objects are merely code contractions. Developers, for example, can drag an icon — which represents all the code to send a document to a printer — into the proper place within their networking code, saving them the need to recreate software for every product.

That notion is not new. Rudimentary modular programming was born about

the same time as 21-year-old Firmage, said John DeArmon, an analyst at Dataqest, Inc. Until recently, the price/performance ratios of hardware made object technology commercially impractical. Now, with affordable workstations bulging with computing muscle, he said, Serius stands at the edge of a $350 million to $400 million market that he expects to grow at a minimum rate of 35% annually for the next five years.

Much of that market consists of in-house developers whose options are limited to using shrink-wrapped software or writing their own from scratch.

Peter Kastner, vice president at Aberdeen Group in Boston, said those opting for building their own can choose from packages such as Borland International, Inc.'s Objectvision.

"But Objectvision comes with 25 pounds of documentation," Kastner said. Serius, he said, is far less daunting.

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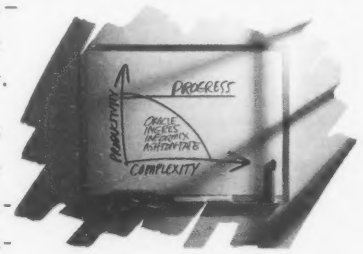

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Playing games can be all in a day's work

BY ALICE LAPLANTE
SPECIAL TO CW

If James Wood is caught playing a computer game during office hours, his boss is more likely to give him a pat on the back than a reprimand.

Wood is computer systems supervisor at Lucasfilm Games, a division of San Rafael, Calif.-based Lucasarts Entertainment Co., which produces both movies and computer games. It's part of Wood's job to be familiar with his company's game products, which include such titles as The Secret Weapons of the Lufpwaffe and Indiana Jones and the Fate of Atlantis.

Wood doesn't actually work on the games. His job is to support the division's personal computers and Apple Computer, Inc. Macintoshes. Still, familiarity with the end product is important, he says, "because I keep track of how systems problems will affect development projects, and I need to know how to prioritize any problems that arise."

At some companies, the connection is even more direct, and information systems employees are regularly drafted for product testing. When it gets close to product release time at Maxis, a computer games company in Orinda, Calif., that makes the highly popular Simcity, a simulation game that allows users to plan entire communities, "everyone in the company stops what they are doing and starts playing games," says Tony Rumph, MIS manager.

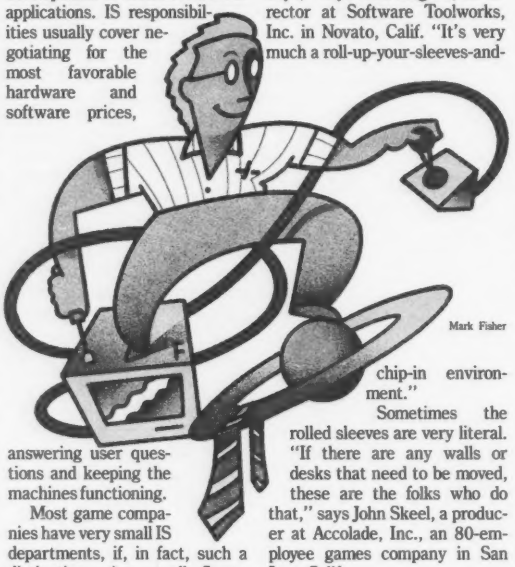
Better than work

If this sounds like more fun than working in a traditional IS department, Wood and other IS managers at computer game software companies say, "It is!" and prove the point by taking salaries that are usually lower than average for their positions. Wood, for example, estimates that he could probably be earning $10,000 more working in the IS department at a bank.

Indeed, almost all of them say they could make more money working for Fortune 1,000 firms, but they prefer the more casual and creative atmosphere of the games industry. Darryl Peck, president of Inline Design in Sharon, Conn., a $1 million marketer of computer games such as Darwin's Dilemma, freely admits he can't compete with the salaries at more traditional IS jobs. "But that kind of person probably wouldn't be interested in working here anyway," he says.

In fact, those interested in expanding their technical skills would probably not find most jobs in this business appealing. There are some exceptions. Rumph, for example, says that his company is very technology-conscious and believes in obtaining the latest software, systems and networks.

For the most part, however, games companies are equipped like small, growing businesses everywhere. Few have any systems larger than PCs, which are used for everything from games development to routine business applications. IS responsibilities usually cover negotiating for the most favorable hardware and software prices, answering user questions and keeping the machines functioning.



Mark Fisher

Most game companies have very small IS departments, if, in fact, such a distinction exists at all. Sometimes systems responsibilities are simply shared by all employees. Even when a more formal structure does exist, IS staffers are expected to be flexible, adaptable and willing to pitch in wherever they are needed.

"I look for people with a lot of energy, who have a very service-oriented approach and don't perceive their job as sitting in front of a terminal and punching keys," says Don Hughes, IS director at Software Toolworks, Inc. in Novato, Calif. "It's very much a roll-up-your-sleeves-and-chip-in environment."

Sometimes the rolled sleeves are very literal. "If there are any walls or desks that need to be moved, these are the folks who do that," says John Skeel, a producer at Accolade, Inc., an 80-employee games company in San Jose, Calif.

If IS professionals in this industry are sometimes asked to handle low-level jobs, they are also frequently given opportunities to stretch upward.

At Greatwave Software, Inc. in Scotts Valley, Calif., for example, programmers customarily do more than just program. "One programmer is in charge of the customer database; another is in charge of financial accounting functions," says Chad Mitchell, chief technical officer at the firm.

At Acclaim Entertainment, Inc. in Oyster Bay, N.Y., John Ma, vice president of planning and operations, is currently looking for an IS professional to work with the company's sales group on automation of key accounting processes. One requirement, Ma says, is that "he or she will need to function as a full member of the management team."

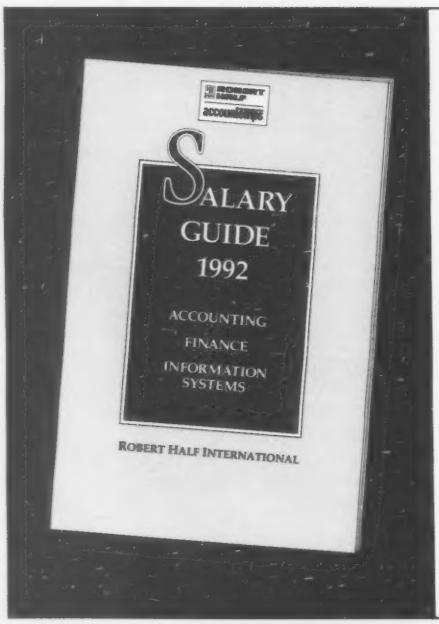
Into development

Occasionally, IS staffers even go beyond playing games and move into development.

But, according to Peter Brown, director of technical services at Electronic Arts in San Mateo, Calif., that's more the exception than the rule because the personalities that are drawn to the two kinds of jobs tend to be quite different. Developers wear blue jeans and long hair, he says. IS people may wear blue jeans, but their hair is usually short, and sometimes they even add a tie.

The way Brown sees it, "This kind of career track is for the IS professional looking for a little bit of a change, who could fit into a standard IS division, but wants a more relaxed atmosphere."

LaPlante is a free-lance writer based in Palo Alto, Calif.



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Economy causes tight S/36 job market

Fast Track is a twice-monthly column dedicated to answering questions on career directions.

BY KEVIN M. STEELE
SPECIAL TO CW

Q What options are available for an unemployed System/36 programmer who possesses light System/38 and Application System/400 experience? I've had more than a dozen interviews in the last seven months, but the New England market for the S/36 is tight.

Are there other areas of the country that offer better opportunities for the IBM midrange professional?

R. B.
Springfield, Mass.

A The economic situation in New England has produced an extremely tight employment market. I am not aware of any specific part of the country that would offer more IBM midrange opportunities. Sell your ability to learn and pick up new skills quickly. Give examples of past performance and accomplishments. Make it clear to any potential employer that you will be a productive long-term employee.

Q I have a bachelor's degree in computer science and a master's degree in information systems, and now I am pursuing an MBA. Currently, I work as a programmer for a major telecommunications company. Do you think I would be overqualified with an MBA? If not, where does this additional degree put me salary-wise? My salary is in the low 30s.

Initials and town withheld

A If you started working six months ago, you're doing quite well. If, on the other hand, you've been employed six years, it would seem that your salary is low. While the MBA should add to your already impressive educational background and aid you in attaining a position of increasing responsibility, it may not translate into additional dollars immediately.

FAST TRACK
CAREER ADVICE FOR THE '90s

Q I have more than 15 years of large system (IBM mainframe) experience. The early years included IMS application programming, system programming and database administration. The last few years have included project management, administrative and strategic planning positions.

I plan to look for a new job. How can I locate companies that are looking for generalist/management skills such as mine? While I am conversant in many newer technologies, I am certainly no specialist.

Initials and town withheld

A While many companies are investigating and implementing "newer technologies," it would be a mistake to undervalue your experience.

Research corporations that are similar in size and industry to the businesses that you've worked for in the past. Put together a resume and introduction letter that outlines your interests and personal requirements. You may also want to investigate recruitment firms that specialize in IS.

Q I have four years of experience in data processing, two years of experience as a programmer/analyst and two years of experience in technical support. I have a bachelor's degree in economics and an associate's degree in computer IS.

A management position is one of my career goals, and I feel that getting a master's degree is the next step I must take. I am unsure what type of degree to get. What sort of academic background would you consider most suitable for advancement into management?

Initials and town withheld

A I would recommend you focus your efforts toward a master's degree in IS with as many business course electives as possible. In the meantime, communicate your interest in management to your company.

Many firms will promote promising employees to entry-level supervisory roles without a long wait. Ideally, try to get yourself into a management development program at work that will coincide with your education efforts.

Steele is executive vice president at Winter, Wyman & Co., an executive placement firm in Waltham, Mass., that specializes in IS.

We welcome your questions. Send them to Kelly Dwyer, Careers Fast Track, Computerworld, *375 Cochituate Road, Framingham, Mass. 01701, or fax them to (508) 875-8931. Your initials and town will be printed unless you request otherwise.*

TIP of the MONTH

How do you motivate an IS staff?

Give them responsibility. Let them take charge of a project from the ground up. We do communicate throughout and do some brainstorming if there's a problem, but it's never presented as: "You will do it this way." As a person can handle more responsibility, we give them more.

John Robinson, director of data processing
Walla Walla County, Walla Walla, Wash.

People are motivated by knowing they are doing something that counts, but they won't know unless you tell them. Communication is key. Let your staff know what you're trying to accomplish and how a project they are working on will provide real value to the ongoing efforts of the organization.

Roger Peterson, director of IS
Kawasaki Motors Corp. USA, Irvine, Calif.

The quality of the work environment is a big motivator. This involves freedom and giving them as much information as possible about the business impact of a project. It also means working with technologically current tools.

Roxolana Poluchowicz
Manager, computing facilities
Stone Container Corp., Chicago

I think personnel testing can help managers learn more about their employees and what motivates them. Things like tests are only tools, though. They don't replace what a manager must know and do — which is to work with your staff day-to-day, talk to them and get to know them.

Rick Marolt, information services manager
Great Central Insurance Co., Peoria, Ill.

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Jack Crossman, director, Computer Services
Area Education Agency 7, Cedar Falls, Iowa

Kathleen Gow is a free-lance writer based in Medford, Mass.

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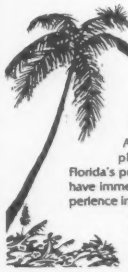

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Programmer/Analyst - analyze, design, develop computer applications, software and databases; write specifications; install, test and debug. 4 years experience required. Experience should include one year using DB2, MVS/XA and IMS DB/DC, and two years experience using CICS. 40 hours per week (7:00 am - 3:30 pm); $33,000 per year. Send resume in duplicate to: Illinois Dept. of Employment Security, 4073 16th Street, Suite F, Moline, IL 61265. Attn: Ruth Rose, Ref. No. 4486-B. An employer paid ad. No calls.

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An international data processing consulting company is seeking applicants with a background in Electronic Data Interchange to work at their Roselle, Illinois location. The job requires a minimum of one year experience working in the DOS/VSE (Disk Operating System/Virtual Storage Extended) and/or MVS (Multiple Virtual Storage) environments, using COBOL (COmmon Business Oriented Language) as a primary programming language. Also required is a minimum of one year experience in CICS (Customer Information Control System) command language and DB2 (Data Base 2); a minimum of one year of working knowledge of Electronic Data Interchange (EDI) including mapping of business documents into ANSI X12 (American National Standards Institute) and/or EDIFACT (International standard - EDI For Administration, Commerce and Transport) standards. Responsibilities include analyzing and evaluating business systems, devising computer programs, systems and related procedures to process EDI transmissions in ANSI X12 and EDIFACT standards, in DOS/VSE or MVS environments, utilizing COBOL as the programming language. Provide consultation to our clients for selection and interfacing with Value Added Network (VAN) which enable electronic transmission of business documents on a domestic and international scale. This requires ability to travel domestically 30% of the time, working at the client site. Duties also include implementation and maintenance of the EDI systems developed; handling trouble-shooting on a day-to-day basis; and provide consultation in integration of EDI transmission with client's in-house applications using Data Base 2 (DB2) database; develop on-line systems using CICS. A Master's degree in Management Information Systems is required. This position will have an annual starting salary of $31,000 and working hours of 8:00 AM to 4:00 PM. (40 hour work week). A complete benefit package is available. Applicants must have proof of legal authority to work permanently in the U.S. and should reply in writing by sending 2 copies of their resume which must include salary history and requirements to: ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State - 3 South, Chicago, Illinois 60605. Attention: JACK SCHAFFER. Reference # V-IL 4098-J. NO CALLS. AN EMPLOYER PAID AD. AA/EEO/V/H/M/F.

SENIOR CONSULTANT

Software consulting company seeks Senior Consultant. Duties include the following: provide functional and/or technical expertise in the execution of client contract deliverables. Recommend approach, work plan and specific tasks to meet deliverables. Analyze assignments, recommend changes, generate approaches consistent with company and/or client needs. Develop and implement functional modifications and/or technical changes/alternatives to meet the client's requirements. Provide on-site training, both formal and informal, to consultants and client staff. Work with client users and technical staff to increase their knowledge of the company's Integral System packages. 40 hours/week; Hours: 9 to 5; $54,300 per year. Pos. requires a bachelor's degree or equivalent in computer science; at least six yrs. exp. in the pos. offered or as a technical systems analyst/engineer in human resources or payroll; at least two yrs. project management experience; in depth working knowledge of VM/CMS; DOS/VSE and MVS/TSO utilizing CICS/ VSAM, SQL/DS and CSP/DB2 database file structures with respect to human resource and accounting applications; ability to perform Database Administrator functions as required; demonstrated ability to solve clients' data processing problems efficiently and effectively; willingness to travel to client sites approximately 50% of the time. Must have proof of legal authority to work permanently in the U.S. Applicants should send their resumes to: Illinois Department of Employment Security, 401 South State Street - 3 South, Chicago, Illinois, Attention: Maxine Counts, Reference # V-IL 4233C. No Calls - an Employer Paid Ad.

Data analyst to create, maintain and test data components for Management Information Systems (MIS) development programs. Review proposals, gather facts, analyze data, compare alternatives and recommend a course of action. Prepare specifications, determine and resolve data problems and participate in project development effort. Design data systems that meet business and professional needs of client. Requires Master of Science Degree in Business: Information Systems Analysis and Design; Completion of following university level courses: (a) computer-based data management; and database management systems for design and implementation, including the study of Entity Relationship principles and logical data design and relational databases. (b) 1 graduate course in business analysis and design of computer-based systems, including the study of Systems Development Life Cycle practices by using CASE tools. (c) Graduate business courses in Corporate Financing, Managerial Accounting or Risk Management. 1 undergraduate course in COBOL programming or Natural fourth generation language. 6 months part-time experience in IBM PC's or compatibles. $28,809.49 per year, 38.33 hrs/wk. Resume to Al London, Job Order #0556265, Job Service Office, 206 N. Broom, Madison, WI 53703. Employer Paid Ad.

"Our recent recruitment advertisement in Computerworld generated an exceptionally high percentage of qualified responses..."

- *Rick Bawsel*
Staffing Manager and
Regional Recruiting Coordinator
GE Consulting Services

GE Consulting Services is a leading provider of software solutions for complex information systems problems. Specializing in technology migration, new applications, software, and user support, the company services large Fortune 500 companies, as well as supports internal G.E. activities. With such diversity, explains Rick Bawsel, their hiring typically encompasses two or three technical arenas.

"Our business tends to focus on certain niches - on-line relational databases, CASE tools, and, with our newly launched PC solution centers, advanced PC development projects... When it comes to recruitment advertising, we need a vehicle that reaches qualified professionals with... backgrounds in the CASE, database, and Unix arenas. To recruit high-level professionals with these specialized skill sets, *Computerworld* is our most viable advertising vehicle. With its industry-wide focus, I know people in Unix shops will see our ad as easily as people in IBM shops.

"Our recent recruitment advertisement in *Computerworld* generated an exceptionally high percentage of qualified responses - more than double that of a local newspaper advertisement. And, since we consistently receive qualified resumes five and six weeks after each advertisement runs, we know *Computerworld* has a long shelf life for generating responses. When I need to recruit strong talent in a cross section of leading-edge technologies, *Computerworld* is by far the best answer.

"*Computerworld* offers a wide range of benefits that is unique in the industry. ...We get the option of advertising regionally...its time responsiveness as a news-weekly means I don't have to wait a month for our advertisement to start working...*Computerworld's* bonus distribution took our advertisement to attendees at CASE WORLD in Los Angeles.

"...Our type of quality talent is difficult to find and typically not available in the local marketplace. Simply put, we advertise in *Computerworld* to attract leading-edge technical talent across the board."

Computerworld. It's where serious employers - like Rick Bawsel - reach qualified candidates with key computer skills. Every week. Whether you use computers, make computers, or sell computer products and services, *Computerworld* can help you recruit the experienced professionals your business demands. For all the facts, call John Corrigan, Vice President/Classified Advertising, at 800/343-6474 (in MA, 508/879-0700).

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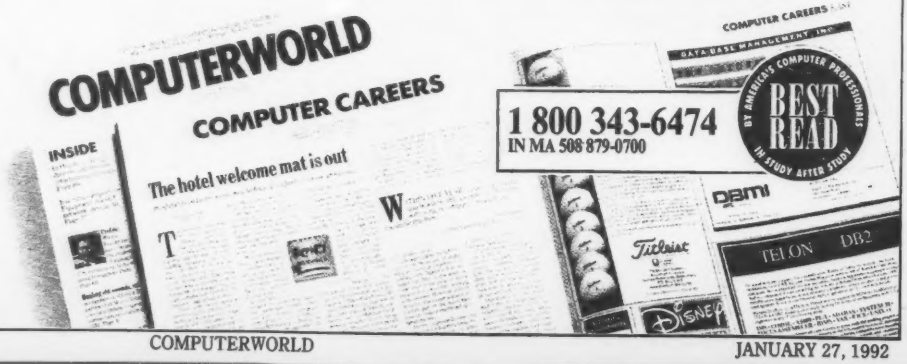

Software Engineer responsible for research, development, implementation & documentation of a raster image system for large format engineering documents. The system will be used to capture hard copy documents or CAD generated images & store them electronically in industry standard format. The system will use the relation data model to control access to the system by any authorized data consumer throughout the Company. Output from the system will be to image capable devices & printers. Duties include requirements analysis, specification, design & implementation of the capture & display subsystems. The capture system would include scanning paper or film, image crop & conversion to industry standard formats or translations from CAD systems to the same format. The candidate must be able to develop a user friendly system for quality control & data verification of scanned images. Requirements for this position are a Master's degree in Computer Science and one year of experience in the following areas: Computer Graphics Applications Development, CAD systems development & Relational Database Management Systems. Background in VMS, UNIX & MS-DOS operating systems, C language, advanced graphics, building of 3D graphics library & creating graphical user interfaces for the X-WINDOWS system, using the Xt toolkit & Xlib library & UNIX Shell programming. 40 hr work week: 8:15am - 5:00pm. Salary $39,603.20 If you are interested in the above position, please forward (2) resumes to: Attention: Job Order #2433, P.O. Box 8958, Boston, MA 02114 EOE

HOSPITAL INFORMATION SYSTEMS DIRECTOR

HealthTrust, Inc. - The Hospital Company is one of the nation's largest hospital companies. HealthTrust, Inc. is a dynamic organization made up of approximately 22,000 employees. The company's goal is to be instrumental in bringing quality healthcare into the communities in which it operates.

Hospital Information Systems Director positions currently available. These positions are hospital based and available in many desirable locations.

License/Education required: Degreed individuals with hospital and Information System Management experience preferred. Responsible for all computer functions at several of the hospitals.

Please send a confidential resume to HealthTrust, Inc., Employee Relations Department, 4525 Harding Road, Nashville, TN 37205 *No Phone Calls*

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Anne Story, 1940 116th Avenue N.E., Bellevue, WA 98004
(206) 637-0130 FAX (206) 637-9550

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GSI's International Product Development, a leader in supplying software for distribution and financial management, seeks the following qualified professionals to complement our team:

Application Designer - Strong analytical and communication skills. Experienced with business application design, development, and implementation. Knowledge of one of the following required: Event Driven Design, GUT, Client/Server, Database Modeling.

Software Engineer - Experienced Object Oriented programmer to develop Client/Server business applications using C++. Working knowledge of Unix and WINDOWS is required. Exposure to any of the following areas is considered a plus: Informix, Rdb, Tuxedo, VMS, OS2, MSDOS.

Quality Assurance Engineer - Analyst with 1-3 years minimum experience in software testing or software quality assurance. Responsibilities include developing software standards, preparing structured test plans, performing software testing scenarios, and producing documentation for all quality assurance activities.

GSI Transcomm is an international firm with offices nationwide, headquartered in Pittsburgh, PA. A competitive salary, full benefits, and career growth are available to selected candidates. Please submit resume and salary requirements to:

gsi transcomm

1380 Old Freeport Road, Pittsburgh, PA 15238
No Agencies Please.

Education Design Specialist

Designs and develops corporate workstation computer-based training (WS-CBT) based on instructional design theory and the instructional systems life cycle (ISLC) methodology. Performs training needs assessment, definition and instructional (job and task) analysis. Develops methods to measure effectiveness of WS-CBT training systems and determines if training objectives have been achieved. Designs delivery system specifications necessary to convert Macintosh developed training to IBM 386 Window platform. Creates the WS-CBT toolkit to automate the WS-CBT development process to enhance the ISLC. Authors WS-CBT instruction for various projects. Provides consultant services including technical and instructional systems design support for WS-CBT development.

Education Required: Master of Science in Instructional Systems or Instructional Technology. Academic course work must include 3 credit hours in expert systems and database systems. Experience Required: One year as a Research Assistant. Experience must include applying Gagne & Briggs instructional design model in the development of performance-based training.

The minimum working hours are 40 hours per week, with a starting salary of $33,540 per year. This ad is employer paid.

Please send resume in confidence to: Michigan Employment Security Commission, 7310 Woodward Avenue, Room 415, Detroit, Michigan 48202. Reference No. 109991.

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BUSINESS PROGRAMMER/ANALYST - Responsible for designing and programming integrated multiuser database information system utilizing PARADOX PAL programming language for company's business and manufacturing information needs; manage and troubleshoot NOVELL LAN; generate technical reports for management; design and write user manuals; evaluate old systems and develop new alternatives to improve old systems; resolve IBM compatible PC hardware and software problems. REQUIREMENTS: Must possess Bachelor of Science degree in Information Systems and 2 yrs. exp. in the job offered plus 1 yr. exp. programming in DOS environment. Must possess at least 2 yrs. PARADOX PAL programming exp. in a multiuser (LAN) environment. Applicant must also possess ability to manage and troubleshoot NOVELL LAN and ability to resolve IBM compatible PC hardware and software problems. Strong accounting background required. Sal. $30,000/yr, 40 hrs/wk.; Must have proof of legal authority to work permanently in the U.S. Apply to: Georgia Department of Labor, Job Order # GA 5523447, 2972 Ask-Key Drive, Smyrna, Georgia 30082 or to the nearest Georgia Job Service Center.

Programmer/Analyst. 35 hrs per week, 9AM-5PM, $28,000 annual salary. Design, program and test "AD/Vantage" case tool on the IBM AS/400 by utilizing RPG III, SQL and CL. Analyze file management system; Design and develop error message handling system to support case tool; Modify import file system to allow users to dynamically access the information. Bachelor in Computer Science. Experience must be as a Programmer/Analyst on IBM AS/400 utilizing RPG III. Must have proof of legal authority to work permanently in the U.S. Applicants send resumes to: ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 3 South, Chicago, IL 60605. Attention: Annette Fox, Reference # V-IL-4955-N. NO CALLS. 2 Copies of your Resume Required. An Employer Paid Ad.

IS DIRECTORS

If you need good people, we've got them. Computerworld reaches more than 629,000 computer professionals every week. That's more qualified computer pros than any newspaper can deliver. And you can select either a regional edition or national edition of Computerworld's Computer Careers section for your advertisement.

For more Recruitment information, or to place your ad regionally or nationally, call Lisa McGrath at 800-343-6474 (in MA, 508-879-0700).

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Software Engineer, 40 hrs/wk. 8:00am - 5:00pm, $30,600/yr. Systems software development, unit testing and system integration for building factory control products in a computer-integrated manufacturing environment. Projects include: materials handling systems with VAX/VMS; robotics control; asynchronous data communications; real time programming in C; protocol data analyzer; Decnet communications; inventory control; report generation; research on expert database systems. Tools: VAX/VMS, ULTRIX; PLC2; RSX; SPF and SECS; INGRES/ESQL; C; Pascal. M.S. in Computer Science required. Completion of all coursework is acceptable in lieu of M.S. Graduate education must include one course in Data Communications using TCP/IP as well as one project each in: INGRES/ESQL and C; development of expert database systems. Must have proof of legal authority to work permanently in the U.S. Send 2 copies of your resume to: ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 3 South, Chicago, Illinois 60605, Attention: Mary Miles, Reference #V-IL-3853-M, NO CALLS, AN EMPLOYER PAID AD.

Information Systems Coordinator, 40 hr./wk. 9:00am - 5:00pm, $29,000/yr. Develop, modify, and maintain complex business software for integrated financial, human resources and manufacturing systems software. Programming in C and Assembler. Tools: Micro and minicomputer AS/400; C/UNIX; Assembler; RISC processor; REXX; XEDIT-Macro screen interface; E-R modeling. MS in Computer Science required. Graduate education must include one project each in: design of a financial management system on a relational database using E-R modeling; system design on relational database using REXX and XEDIT-Macro screen interface. Must have proof of legal authority to work permanently in the U.S. Send resume to: ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 3 South, Chicago, Illinois 60605, Attention: Len Bokea, Reference #V-IL-3944-B, NO CALLS, An Employer Paid Ad.

Software Engineer, 40 hrs/wk. 9:00 a.m. - 5:00 p.m., $45,505.00 per annum; Design and develop software for advanced telecommunications network. Create a prototype for the next generation of local area network systems based on optical transmission. Design and implement multi-layer bar graphics and an internal security system using Actor programming language. Use Queuing, LAN, WAN and Memory model theories of software performance modeling to design and implement mathematical models. PhD in Computer Science and two years experience as Software Engineer or Research Engineer required. Previous education or experience must include one year of work with graphical systems, the development of communication networks and real time data acquisition systems, including broadband ISDN, MAN, Actor and LAN, and the use of the Queuing modeling theory. Must have proof of legal authority to work permanently in the U.S. Send resumes to Illinois Department of Employment Security, 401 S. State Street, 3-South, Chicago, IL 60605, Attn: Myra J. Stoll, Reference #V-IL 4654-Y, NO CALLS, AN EMPLOYER PAID AD.

Scientist I. Resp. for developing theory & computer implementation of Bayesian stats. as applied to model-based data analysis & supervised learning on large scientific databases. Duties incl. interaction with other members of artificial intelligence branch in developing probabilistic approaches. Also incl. developing, implementing & testing algorithms on NASA applic., doing original rsrch in model-based data interpretation with uncertain data & writing up completed rsrch for publication. Reqs. Ph.D. or completion of doctoral work in C.S. Doctoral conc. should be in the field of Artificial Intelligence. Reqs. rsrch. backgr. in Bayesian stats., both the theory & its application, to problems of data analysis & supervised learning in artificial intelligence, such as decision trees or probabilistic networks; rsrch. backgr. in designing & implementing such supervised learning algorithms; & rsrch. backgr. in artificial intelligence applic. of data analysis. All of these reqts. should be reflected by a record of publications in this area or thesis work on related topics. Salary: $61,143/yr. Job & interview site: Moffett Field, CA. Send this ad & a resume to Job #AM7523, P.O. Box 9560, Sacramento, CA 95823-0560 not later than February 11, 1992. Must have legal right to work.

MONTANA! State Department of Transportation has immediate opportunities for junior programmer/analyst. We require two or more years experience using VAX-VMS DCL (PL/1, COBOL, or FORTRAN) with ORACLE, SQL*PLUS, SQL*FORMS. Will also accept a Masters in Computer Science with emphasis on relational theory plus two or more months of ORACLE experience (using SQL*PLUS and SQL*FORMS). Good benefits. Salary starts at $23,588/yr. Closing date: 2/21/92. COMPLETED APPLICATION MUST BE RECEIVED AT THE ADDRESS BELOW BY THE CLOSING DATE. Request state application for position 81007 immediately from: Helena Job Service Office, 715 Front St., Helena, Montana 59601 (406) 449-6006. EOE/AA

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CDI
Computer Development Inc.
A Subsidiary of Metallic Corporation

We are a software development company located in Wakefield, MA, and we are seeking the following professional to work in our Los Angeles office:

SYSTEMS PROGRAMMER

The appropriate candidate will have a BS in a computer-related field and 3 + years of experience in an IBM mainframe environment. Strong background in VSAM and CICS from a system and application perspective. MVS and Data Comm. experience a plus. Position requires 25% travel.

We are also seeking the following professional to be based in the Boston area:

RETAIL SYSTEMS TRAINER

The appropriate candidate will have a BS degree in communications or a related field and 3 + years experience in training, preferably in retail. Strong platform skills; retail systems experience a plus.

No phone calls, please.
Please send resume and salary requirements to:
CDI
60 Harvard Mill Square
Wakefield, MA 01880
FAX: (617) 245-0494

PROGRAMMER/ ANALYST

Perform new systems development and enjoy high visibility as a Programmer/Analyst for CHF Industries, Inc. We are a major manufacturer of home furnishings products with corporate offices in Charlotte, North Carolina. Charlotte is a dynamic, growing city in the Southeast that offers an abundance of cultural, recreational, and professional opportunities.

We are currently seeking several MIS professionals to support our state-of-the-art mainframe environment. We're currently operating in an ES9000/210 OS/MVS/ESA environment with major development being done in Electronic-Data-Interchange (EDI), CAS-Order Processing, CAS-Manufacturing and all other CAS-Manufacturing modules utilizing an IDMS/R database structure.

Applicants must have 2-5 years experience working with IDMS.

Become a valued member of our expanding Information Systems Department. We offer a competitive salary and excellent benefits package which includes major medical/ dental insurance, life and disability insurance, 401K plan, pension plan, and relocation assistance. For consideration, please submit your resume **which must include salary history** to: **CHF INDUSTRIES, INC., Dept. PA, P.O. Box 410727, Charlotte, NC 28241.**

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immediate openings

in Atlanta and in New York
for Programmer/Analysts with background in:

NeXT C++
Windows UNIX
Objective C

Background in Trading Systems application development in a similar environment is highly desirable.

We are Sofsys, Inc., a software development and consulting services firm based in the suburban Atlanta area. We have a very long term software development project which requires professionals with the above skills. Serious candidates may rush their resumes to:

Sofsys, Inc.

P O Box 671672, Marietta, GA 30067
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ORACLE SIX GIGABYTES

Opportunities exist with an industry leader in Denver, Colorado, to participate in the development of large scale ORACLE/UNIX applications using ORACLE case tools. Must have worked in a major, large scale environment to include performance tuning of ORACLE/UNIX applications/data base.

We are staffing the following full time positions:
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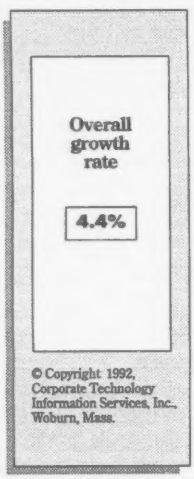
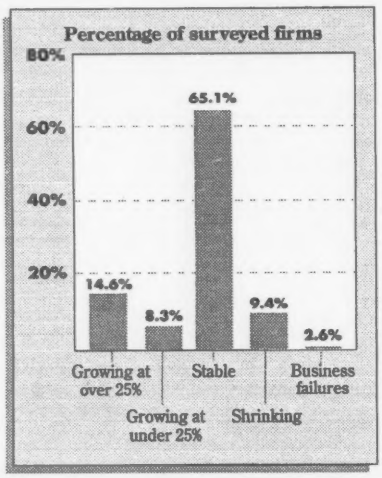
SOFTWARE ENGINEER

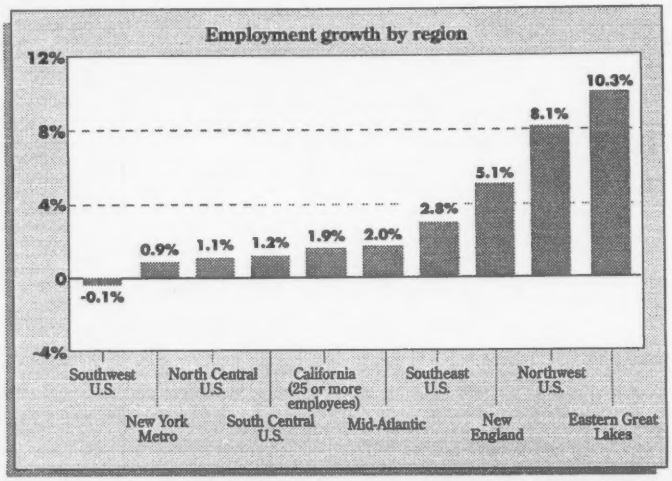
Working as part of a team to redesign complex requirements engineering software. Duties include designing and developing the software to work in both VAX and Sun workstation environments. This software will run in networking as well as standalone environments and must provide user friendly computer graphics and database interfaces. Must also provide technical assistance to clients and perform hardware and software maintenance on employer's systems. Requires knowledge of RTrace® internal code, intensive use of the Ingres DBMS system, X Windows, Motif, Open Windows, Sun View and the "C" programming language. Salary of $31K/year, position is located in Detroit Metro area. Please send resume to HR, Protocol, A Division of Zycad, 100 International Dr., Mt. Olive, NJ 07828. Zycad is AA/EEO employer.

Computerworld/Corptech Career Index

PROSPEROUS LAND — Biotechnology may prove to be a market with a rush of new employment opportunities. In a year's time, the combined employee counts at 190 biotech firms increased by an average of 4.4%.







MAINFRAME DEVELOPER

Startup Opportunity

Mission Critical Software, Inc., intends to provide the "industrial strength" systems management tools that Fortune 500 companies *must* have before they can move their mission-critical applications from mainframes to the new distributed computing platforms. Because the datacenter is the logical point of control for enterprise computing, we need a "**wizard**" **IBM mainframe software developer** also interested in **PC/LAN development** to join our well-financed startup company. If you are bright, intense, love to program, and are attracted to the rewards (and can cope with the risks) that startup ventures offer, please mail, EMAIL, or FAX something about yourself (handwritten OK) to:

MISSION CRITICAL SOFTWARE, INC.
6200 Savoy Drive, Suite 440, Houston, TX 77036
FAX: 713-975-7545 CompuServe: 76357,564
INTERNET: 76357.564@compuserve.com

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Challenging opportunity for a shirt-sleeved manager to join a fast paced, dynamic company. Lead a small group of dedicated data processing professionals to meet the growing needs of an action oriented marketing group. This position requires 10 years experience with at least 5 years managing an ordinary life insurance systems group. We are a Life-Comm III installation with heavy assembler needs.

You will enjoy outstanding working conditions in our beautiful office complex located in South Florida. Along with excellent career growth opportunity, we offer on-site child care, health club & recreational facilities, 401K, pension plan and non-smoking environment. For immediate consideration, send resume to Human Resources, 11222 Quail Roost Drive, Miami, FL 33157.

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Manager, Data Processing to lead a team of analysts engaged in providing technical support as well as systems maintenance & design services for Supervisory Control and Data Acquisition (SCADA) systems used in automated oil field production projects. Analyze problems in such areas as automated well testing, production monitoring & miscible flood injection controls & to reduce data to computer processable format utilizing knowledge of operating systems, real time applications, system analysis & design methodology as well as Fortran, C, Pascal & Assembler & fourth generation languages. Confer with engineering personnel to resolve problems with new systems designs; utilize Graphical User Interface (GUI) to operate SCADA systems; maintain interconnectivity using TCP/IP protocols; perform system administration responsibilities of Concurrent computer systems. Bachelor's degree in Computer Science required as well as 4 years experience in job offered or 4 years experience as Associate Programmer Analyst and/or Programmer. Experience must have included 1 year of experience with SCADA controlled, automated oil field production systems using Fortran, Assembler & fourth generation languages. Experience must also have involved development & installation of automatic well test software as well as providing support to software for enhanced oil recovery using miscible flood, & solvent history & prediction applications. Applicants must have experience with Concurrent operating systems, their utilities & compilers, IBM's VM operating system, CMS, REXX & RSCS. 40 hours 7:30am to 4:30pm, $49,820/year. Apply at the Texas Employment Commission, Houston, Texas or send resume to the Texas Employment Commission, TEC Building, Austin, Texas 78778, J.O. #6521548. Ad Paid by an Equal Opportunity Employer.

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"Our clients - banks, insurance firms, pharmaceutical and chemical companies, and software developers - typically require seasoned professionals with unique, hard-to-find skill sets. However, professionals with a minimum of three years' experience in specific technical areas are often few and far between. To fully satisfy our clients' objectives, I need to target an audience with very technical expertise. With its highly qualified readership, *Computerworld* is crucial in helping us make that match.

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"In our business, recruitment results like these are key. In 1990 we placed about 135 new starts in addition to the employees we already had in place. This year we expect that number to total 165 or possibly higher. To ensure that Devon Consulting continues placing the right professionals in the right jobs, we fully intend to run an ongoing recruitment advertising schedule in *Computerworld*. When it comes to advertising, we believe that consistency is just as important as the size, message, and vehicle.

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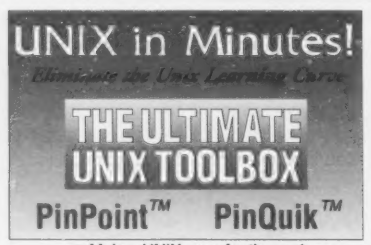

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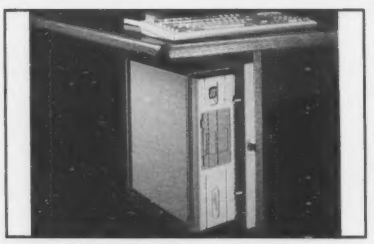

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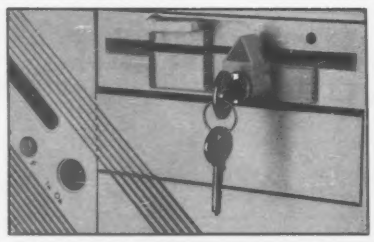

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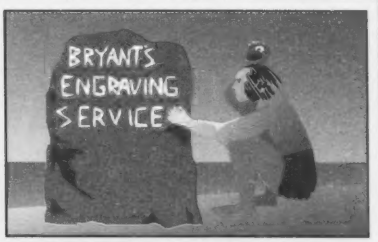

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MARKETPLACE

Licensing can mean hassles, the box-top variety included

Legal eye is a column exploring legal issues and their impact on information systems.

BY MARC S. FRIEDMAN
and LYNN PUCHALSKI
SPECIAL TO CW

Hold on — don't throw that box away! If you do, and the new software you are so anxious to try out is defective, you may be left without a clue about your rights. In fact, any time you buy software, it is best to read the fine print on or in the container first.

Box-top licensing, also known as shrink-wrap licensing, is one of two common ways to license software. It applies when the software is mass-marketed and the software vendor cannot negotiate each license agreement. The other method is a signed software license stating the vendor's terms and conditions.

A box-top license may be found as a package insert in the box or printed right on the outside of the box. Either way, the text contains legal terminology that may limit product warranties and the user's right to sue for damages.

Vendors ensure that the box-top license is binding by stating on the box that by using the software, the user agrees to the terms of the license. If he does not agree to the terms, the user has the option to return the software within a few days of purchase to receive a full refund.

Often, the risk posed by the legal terminology in a box-top license surpasses the cost of the software itself. A company might spend only a few hundred dollars for a software package to keep track of its accounts receivable, but if the product does not perform as advertised or contains errors, the company may lose track of its accounts receivable, causing problems that may exceed the software's wholesale cost. Disclaimers printed on the box may state that the vendor is not liable for such damages.

However, this type of disclaimer may or may not hold true. The question is whether the box-top license is an enforceable contract between the company and the vendor. It may be argued that there was no actual contract because the box-top license was not brought to anyone's attention until after the transaction was finalized.

For example, a New Jersey court held that the provisions of a contract found in the glove compartment of a new automobile after delivery to the buyer were not enforceable and did not interfere with the car owner's right to sue.

A software vendor, however, could argue that fairness and justice dictate that the box-top license be enforced as a contract between it and its customers. They may say the package clearly draws attention to the fact that license provisions are printed on it or on a package insert.

Moreover, the vendor usually gives the customer a few days to return the product if he is dissatisfied. Finally, the vendors argue, the software makers cannot be expected to negotiate every license agreement for software selling for only a few hundred dollars.

In response to vendors' successful lobbying, state legislatures in Louisiana and Illinois passed statutes stating that a box-top license would be enforceable if the package stated that a box-top license was inside, and it provided an out to a dissatisfied user. Both, however, have since been repealed.

Recently, a federal court in Philadelphia decided on a case that raised the issue of the enforceability of box-top licenses. In *Step-Saver Data Systems, Inc.* v. *Wyse Technology, Inc.*, the court found that the box-top license did not create a contract. Instead, it was simply a written confirmation of an oral agreement between the vendor and user that contained additional terms not discussed by the parties involved. By looking at the box-top license in this light, however, the court did not have to decide whether box-top licenses are generally enforceable.

Because it is impossible to predict whether a box-top license will be enforced in a particular case, a software purchaser must always be on guard. If the software can be purchased directly from the vendor, users should insist on a written license agreement instead of the box-top license when possible, and they should also insist on the following conditions:

- All parts of the agreement must be in writing.
- The writing must be signed by the vendor and user.
- The user must receive and retain a copy of the fully executed agreement.

Direct bargaining with a vendor is often not a possibility because the software is mass-marketed or purchased over the counter. A user should carefully review the license before the software is used. If the software is defective, the vendor should be notified immediately and the software returned in accordance with the terms of the license.

OFTEN, THE RISK posed by the legal terminology in a box-top license surpasses the cost of the software itself.

Friedman leads the high-technology group at Friedman Siegelbaum in Roseland, N.J. Puchalski, an attorney at Friedman Siegelbaum, specializes in computer and technology litigation.

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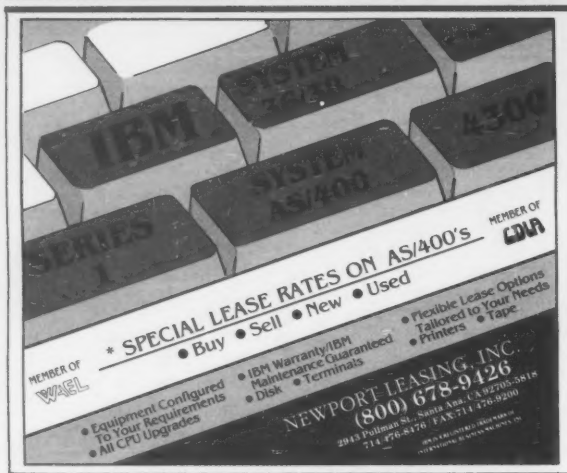
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PS/2 Model 60	$700	$900	$600
PS/2 Model 80	$2,250	$2,600	$2,150
PS/2 Model 90	$4,300	$4,600	$4,100
Compaq Portable II	$400	$500	$375
Portable 286	$900	$1,000	$800
Portable 386	$1,550	$1,700	$1,500
SLT 286	$700	$900	$600
LTE 286	$1,000	$1,300	$900
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INDUSTRY ALMANAC

RECOMMENDATION CHANGES

DOWNGRADED FROM STRONG BUY TO BUY: **Sun Microsystems, Inc.** (Bear, Stearns & Co.). Although Sun shares are still a good buy, Hewlett-Packard Co.'s new low-end workstation could cause downward pressure on Sun stock. Take advantage of this opportunity. Sun workstations, such as the Sparcstation 3 line, which is likely to be announced this summer, may eclipse HP's new systems.

DOWNGRADED FROM MODERATELY ATTRACTIVE TO NEUTRAL: **Borland International, Inc.** (Donaldson, Lufkin & Jenrette Securities Corp.). Borland saw little growth for the quarter just ended. An in-house study suggests that Dbase users are either waiting for the company's upcoming new products or considering alternatives, such as Foxpro. Although Borland has good technology, there is a high risk that its new products will be delayed or simply start out more slowly than anticipated.

UPGRADED FROM UNDERPERFORMER TO NEUTRAL: **Compaq Computer Corp.** (Alex. Brown & Sons, Inc.). Last quarter finished somewhat better than expected for a number of desktop computer companies, including Compaq. This will likely be reflected in its earnings report due out tomorrow. Strong sales for new products, spurred by the company's lower prices, drove the good financials. Also, better-than-budgeted currency swings abroad and continuing efforts at expense control paid off.

UPGRADED FROM NEUTRAL TO MODERATELY ATTRACTIVE: **Micrografx, Inc.** (Donaldson, Lufkin & Jenrette). Business appears to be picking up. The company has focused on low-end drawing and high-end technical illustration sectors of the Microsoft Corp. Windows graphics market, thus sidestepping the intense competition from Microsoft, Lotus Development Corp. and Software Publishing Corp. in the mainstream presentation segment. International sales are strong, too.

MORE 1992 PICKS

Computer Software and Services
Louis Giglio, Bear, Stearns, Jan. 10.

Looking forward, a few old trends and some emerging ones will color the 1992 horizon.

Networking remains the top priority for large computer installations. **Novell, Inc.** continues to be rated buy because of its leadership slot in that sector and its expansion into general operating systems.

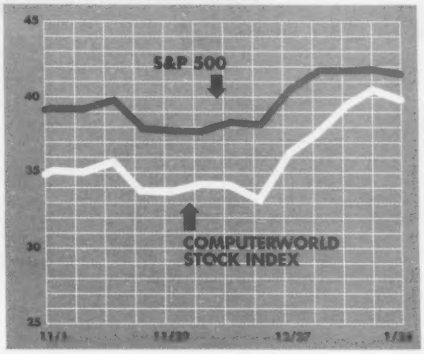
Unix will gain much strength now that hardware independence is a reality. However, hardware will not make Unix a true industry standard — only software can. Therefore, companies that sell tools for easing the software development process — especially those that use object-oriented technology — will have an edge. Buy Borland.

Three factors in a company make its stock worth buying: superior technology, visionary and cost-conscious management and solid marketing.

Two service companies did surprisingly well in the second half of 1991 after lackluster first halves. Revenue at **Policy Management Systems Corp.** was up 60% for the year compared with 1990. **Sungard Data Systems, Inc.** racked up a 68% sales gain in 1991 over the year before. They are rated neutral now, but look for more user outsourcing this year.

KIM S. NASH

STOCK TRADING INDEX



THIS WEEK'S HIGHLIGHTS

- Last week's big losers included Data General Corp. (see story page 6), which plummeted 5½ points — more than 30% — to close Thursday at 12⅛. DG's first-quarter profits were weaker than expected.
- Quarterly earnings influenced stock movement elsewhere. Borland International, Inc. reported higher income but lower sales for its fiscal third-quarter 1992, compared with the same period last year. Borland shares sank 3⅜ points last week to 71⅜. Quarterly profits at Unisys Corp. went up, as did its stock, which gained 1½ points to 7 (see story page 6).
- Among other gainers, Network General Corp. surged 2¾ points, closing Thursday at 22¾. Advanced Micro Devices, Inc. jumped 2⅞ to 20⅝.
- After introducing five new Unix workstations last week, IBM stumbled 1¾ points to 93½. Meanwhile, Sun Microsystems, Inc. picked up 1⅛ points to 34⅛, and Hewlett-Packard Co. lost 2 points to 60¾.

Computerworld Friday Stock Ticker

CLOSING PRICES FRIDAY, JANUARY 24, 1992

TOP PERCENT GAINERS

Unisys Corp.	45.45
Artel Communication Corp.	30.43
Intellicorp Inc.	29.20
Wang Labs Inc. (b)	28.00
Ultimate Corp.	21.05

TOP PERCENT LOSERS

Data General Corp.	-31.69
Comshare Inc.	-19.74
Gandalf Technologies Inc.	-14.29
Intergraph	-12.79
Comdisco Inc.	-12.02

TOP DOLLAR GAINERS

Matsushita Electronics	5.50
Network General	3.38
Datatram Corp.	2.75
Computer Associates	2.63
Unisys Corp.	2.50

TOP DOLLAR LOSERS

Data General Corp.	-5.63
3M Co.	-4.88
BMC Software Inc.	-4.38
Cray Research Inc.	-3.88
Comshare Inc.	-3.75

Exch	52-Week		Range	Jan. 24 Close	Wk Net Change	Wk Pct Change
Communications and Network Services					**Up 0.94%**	
OTC	13.13	6.75	3 COM Corp.	13.13	0.25	1.94
NYS	69.75	55.75	American Info Techs Corp.	64.13	0.25	0.39
NYS	41.38	31.13	AT&T	38.50	-2.25	-5.52
OTC	4.13	1.25	Artel Communication Corp.	3.75	0.88	30.43
NYS	52.75	43.00	Bell Atlantic Corp.	47.75	2.00	4.37
NYS	54.38	45.38	Bellsouth Corp.	50.63	0.63	1.25
NYS	60.50	30.25	Cabletron Systems	60.50	1.75	2.98
OTC	35.25	12.38	Compression Labs Inc.	29.00	-1.50	-4.92
OTC	5.13	1.50	Data Switch Corp.	2.88	0.25	9.52
NYS	23.50	12.38	Digital Comm. Assoc.	21.63	-0.38	-1.70
OTC	25.25	14.00	Dynatech Corp.	19.75	-0.50	-2.47
OTC	12.38	5.00	Fibronix Int'l Inc.	8.75	-0.13	-1.41
OTC	29.75	8.50	FileNet Corp.	27.25	-0.50	-1.80
OTC	3.75	1.13	Gandalf Technologies Inc.	2.25	-0.38	-14.29
NYS	3.88	2.13	General Datacomm Inds.	3.50	0.00	0.00
NYS	35.00	28.13	GTE Corp.	32.00	-0.25	-0.78
NYS	63.00	50.00	ITT Corp.	59.50	0.25	0.42
OTC	35.00	20.63	MCI Commmunications Corp.	33.13	0.38	1.15
OTC	14.50	3.50	Microcom Inc.	9.88	0.63	6.76
NYS	18.13	4.13	Network Equipment Tech.	16.13	-1.88	-10.42
OTC	22.88	6.75	Network General	22.88	3.38	17.31
OTC	20.00	10.50	Network Systems Corp.	17.38	0.00	0.00
NYS	49.13	26.88	Northern Telecom Ltd.	48.63	0.88	1.83
OTC	65.00	19.50	Novell Inc.	57.75	-3.50	-5.71
NYS	82.38	68.00	Nynex Corp.	76.25	-0.38	-0.49
NYS	48.75	38.50	Pacific Telesis Group	43.00	1.50	3.61
OTC	11.63	5.63	Penril Data Comm. Ntwks.	8.75	-0.25	-2.78
OTC	50.75	13.75	Picturetel Corp.	47.00	0.00	0.00
NYS	18.63	11.63	Scientific Atlanta Inc.	17.75	0.13	0.71
NYS	66.00	49.00	Southwestern Bell Corp.	61.63	-0.13	-0.20
NYS	31.50	21.25	United Telecom	24.25	-0.75	-3.00
NYS	40.75	33.75	US West Inc.	37.63	0.75	2.03
Computer Systems					**Up 0.88%**	
OTC	20.75	6.75	Advanced Logic Research	9.50	0.25	2.70
ASE	18.50	11.63	Amdahl Corp.	16.75	-1.38	-7.59
OTC	73.25	40.25	Apple Computer Inc.	64.63	-0.13	-0.19
OTC	9.13	2.75	Archive Corp.	5.63	0.13	2.27
OTC	32.75	14.50	AST Research Inc.	22.00	-0.63	-2.76
NYS	9.38	4.75	Bolt, Beranek & Newman	5.63	-0.25	-4.26
NYS	21.63	10.13	Commodore Int'l	19.00	2.00	11.76
NYS	74.25	22.13	Compaq Computer Corp.	34.50	0.75	2.22
OTC	2.63	0.88	Computer Automation Inc.	1.31	-0.13	-8.69
NYS	13.75	7.88	Control Data Corp.	10.13	-0.50	-4.71
NYS	19.75	6.88	Convex Computer	13.38	-1.25	-8.55
NYS	52.25	31.50	Cray Research Inc.	45.00	-3.88	-7.93
NYS	22.50	7.25	Data General Corp.	12.13	-5.63	-31.69
NYS	4.38	1.00	Datapoint Corp.	2.63	0.13	5.00
OTC	36.25	19.50	Dell Computer Corp.	33.13	0.00	0.00
NYS	83.00	48.50	Digital Equipment Corp.	51.88	-1.13	-2.12
NYS	30.75	21.25	Harris Corp.	26.50	-1.63	-5.39
NYS	63.38	36.50	Hewlett Packard Co.	59.25	-2.75	-4.44
NYS	139.75	83.50	IBM	93.13	-3.63	-3.75
OTC	12.00	6.50	Information Int'l	8.75	1.50	20.69
NYS	145.75	105.00	Matsushita Electronics	116.00	5.50	4.98
OTC	20.88	7.88	MIPS Computer Systems	11.25	-1.13	-9.09
OTC	29.50	10.75	Pyramid Technology	15.88	0.88	5.83
OTC	19.75	7.50	Sequent Computer Sys.	17.13	0.50	3.01
NYS	54.00	26.50	Silicon Graphics	49.50	-2.75	-5.26
NYS	51.50	24.75	Stratus Computer Inc.	47.13	-2.63	-5.28
OTC	38.63	20.75	Sun Microsystems Inc.	33.63	-0.50	-1.47
NYS	17.63	9.50	Tandem Computers Inc.	12.75	-0.13	-0.97
OTC	4.75	1.25	Tandon Corp.	2.13	-0.06	-2.88
NYS	36.50	23.38	Tandy Corp.	26.25	-0.38	-1.41
OTC	30.50	9.75	Teradata	30.50	-1.50	-4.69
NYS	6.13	1.13	Ultimate Corp.	2.88	0.50	21.05
NYS	8.00	2.13	Unisys Corp.	8.00	2.50	45.45
ASE	5.75	2.00	Wang Labs Inc. (b)	4.00	0.88	28.00
Software & DP Services					**Off 0.09%**	
OTC	68.50	33.75	Adobe Systems Inc.	63.75	-0.13	-0.20
OTC	12.25	3.50	Alcorp	10.50	0.88	9.09
OTC	59.88	28.75	Aldus Corp.	35.75	1.25	3.62
OTC	28.50	16.25	American Mgmt. Systems	23.75	0.25	1.06
OTC	17.50	9.00	American Software Inc.	17.25	0.38	2.22
NYS	4.63	2.13	Anacomp Inc.	4.63	0.00	0.00
OTC	18.25	12.00	Analysts Int'l	15.88	-0.13	-0.78
OTC	18.13	5.38	ASK Computer Sys.	18.13	0.88	5.07
NYS	49.00	28.63	Auto Data Processing	43.75	-2.38	-5.15
NYS	62.25	29.50	Autodesk Inc.	38.13	-3.39	-8.54
OTC	39.25	21.00	BGS Systems Inc.	37.88	-1.38	-3.50
OTC	79.00	33.00	BMC Software Inc.	71.13	-4.38	-5.79
OTC	17.25	8.75	Boole & Babbage Inc.	16.25	0.00	0.00
OTC	86.75	39.50	Borland Int'l	72.00	-3.25	-4.32
OTC	20.88	7.50	Cognos Inc.	11.00	-1.25	-10.20
NYS	15.13	7.25	Computer Associates	15.13	2.63	21.00
OTC	17.75	7.75	Computer Horizons	11.00	-0.50	-4.35
NYS	82.25	49.50	Computer Sciences	82.00	1.38	1.71
NYS	11.25	7.00	Computer Task Group	8.75	-0.25	-2.78
OTC	22.75	12.00	Comshare Inc.	15.25	-3.75	-19.74
OTC	16.50	7.00	Corporate Software	16.50	1.75	11.86
NYS	66.13	39.25	General Motors E (EDS)	57.00	-3.38	-5.59
OTC	18.75	9.25	Goal Systems Int'l	11.75	-0.50	-4.08
OTC	7.00	2.25	Hogan Systems Inc.	6.13	-0.38	-5.77
OTC	35.00	11.63	Information Resources	32.00	-1.00	-3.03
OTC	24.25	3.25	Informix Corp.	23.25	-0.13	-0.53
OTC	3.63	1.06	Intellicorp Inc.	1.94	0.44	29.20
OTC	31.50	16.25	Intergraph	18.75	-2.75	-12.79
OTC	11.63	4.50	Interleaf Inc.	11.63	1.25	12.05
OTC	20.25	7.38	Intersolv	17.75	-1.00	-5.33
OTC	43.25	10.50	Knowledgeware Inc.	19.75	0.00	0.00
OTC	45.00	20.25	Legent Corp.	37.75	-3.25	-7.93
OTC	40.75	14.75	Lotus Development	32.75	1.00	3.15
OTC	19.00	11.50	Mentor Graphics	17.63	0.38	2.17
OTC	32.00	9.75	Micrografx	29.25	2.25	9.38
OTC	133.25	59.38	Microsoft Corp.	124.63	-1.88	-1.48
OTC	19.25	7.00	Oracle Systems	18.50	0.50	2.78
OTC	10.00	4.38	Phoenix Technologies	8.75	0.38	4.48
OTC	25.25	9.00	Platinum Technology	21.50	-1.50	-6.53
NYS	72.75	43.25	Policy Management Sys.	67.25	-2.13	-3.06
NYS	37.63	17.13	Reynolds & Reynolds	37.38	1.75	4.91
OTC	16.75	6.75	Ross Systems	14.63	-0.88	-5.85
OTC	31.50	18.25	SEI Corp.	29.75	-1.00	-3.25
OTC	24.13	15.00	Shared Medical Systems	23.00	0.75	3.37
OTC	35.25	12.50	Software Publishing Corp.	21.50	0.00	0.00
NYS	24.88	8.00	Sterling Software	21.25	-1.25	-5.56
OTC	21.00	11.50	Sungard Data Sys.	20.00	0.75	3.90
OTC	51.00	17.63	Symantec Corp.	49.50	-0.50	-1.00
NYS	15.50	4.75	System Center Inc.	13.25	0.38	2.91
OTC	26.50	8.34	System Software Assoc.	25.75	-0.25	-0.96
Semiconductors					**Off 0.96%**	
NYS	20.50	6.75	Advanced Micro Devices	20.50	1.75	9.33
NYS	12.50	7.00	Analog Devices Inc.	9.88	-0.50	-4.82
OTC	13.50	7.00	Chips & Technologies	10.88	0.63	6.10
OTC	63.00	38.50	Intel Corp.	62.38	-0.13	-0.20
NYS	12.50	6.50	LSI Logic Corp.	9.75	0.13	1.30
NYS	19.13	10.88	Micron Technology	16.63	-0.63	-3.64
NYS	79.88	49.88	Motorola Inc.	76.75	-3.13	-3.91
NYS	9.00	3.88	National Semiconductor	8.63	0.13	1.47
NYS	47.63	26.00	Texas Instruments	35.00	-0.25	-0.71
OTC	12.25	5.88	VLSI Technology	8.63	-0.50	-5.48
OTC	16.75	4.50	Weitek	5.88	-0.50	-7.84
ASE	6.75	2.00	Western Digital Corp.	3.88	-0.13	-3.13
Peripherals & Subsystems					**Off 0.53%**	
OTC	2.75	1.00	Apertus Technologies	1.31	0.06	5.04
OTC	19.50	7.75	Banctec Inc.	18.00	-0.75	-4.00
OTC	40.50	7.88	Cambex Corp.	38.00	-2.00	-5.00
ASE	11.75	6.75	Cognitronics Corp.	10.00	-0.13	-1.23
NYS	29.75	12.50	Conner Peripherals	19.38	-1.25	-6.06
ASE	24.50	9.63	Dataram Corp.	24.50	2.75	12.64
NYS	14.75	4.88	EMC Corp.	13.75	-0.38	-2.65
NYS	50.25	38.63	Eastman Kodak Co.	48.75	-0.13	-0.26
OTC	11.25	4.75	Emulex Corp.	6.38	-0.13	-1.92
OTC	24.00	14.75	Evans & Sutherland	20.50	-0.50	-2.50
OTC	10.25	4.00	Iomega Corp.	10.13	0.13	1.25
OTC	28.25	14.50	IPL Systems Inc.	21.50	-1.50	-6.52
OTC	9.50	1.63	Maxtor Corp.	8.38	-0.88	-9.46
OTC	18.00	5.50	Micropolis Corp.	11.25	0.00	0.00
NYS	98.75	81.50	3M Co.	93.25	-4.88	-4.97
OTC	10.75	3.50	Printronix Inc.	4.38	0.13	2.94
NYS	26.75	11.25	QMS Inc.	14.88	0.63	4.39
OTC	18.25	8.88	Quantum Corp.	14.50	-0.75	-4.92
NYS	11.00	5.13	Recognition Equipment	10.13	-0.50	-4.71
OTC	11.50	5.38	Rexon Inc.	10.50	0.38	3.70
OTC	19.88	7.13	Seagate Technology	12.88	-0.75	-5.50
NYS	64.25	23.38	Storage Technology	59.25	-2.25	-3.66
NYS	30.88	16.00	Tektronix Inc.	20.13	-0.75	-3.59
OTC	0.53	0.16	Televideo Systems	0.38	0.06	19.01
NYS	71.25	43.13	Xerox Corp.	69.75	-1.13	-1.59
Leasing Companies					**Off 5.53%**	
OTC	16.25	9.25	Amplicon Inc.	13.50	-0.75	-5.26
NYS	28.38	18.13	Comdisco Inc.	20.13	-2.75	-12.02
OTC	16.25	10.25	LDI Corporation	14.75	-0.75	-4.84

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Systems integration strategy

CONTINUED FROM PAGE 1

a good area," he said.

A newly PC-aggressive DEC said it can change the past. (Remember, DEC found no pot of gold under its proprietary Rainbow PC.) The company said it will become a contender via a mix of competitive pricing, industry-standard PCs, sophisticated open architecture networking and support services.

DEC is attacking the PC market from the perspective of a systems integrator, said William Johnson, corporate vice president of marketing. DEC is offering multivendor integration capabilities via its Network Applications Support (NAS) products and bolstering these offerings with a worldwide service organization. NAS products and services may be the only compelling piece of value-added DEC has to offer users already standardized on other brands, observers contend.

DEC's PC strategy could be viewed as a Trojan horse designed to boost sales of its traditional products and services. Aaron Goldberg, a desktop analyst at International Data Corp., contends that if DEC does nothing but raise the level of PCs in the installed based, it will have a multibillion-dollar business. And while this might not offset the slower mainframe and midrange sales, Goldberg hypothesized, for every 100 PCs sold, DEC will also sell a VAX system to function as a server.

Significant opportunity

John T. Rose, vice president at DEC's Personal Computing Systems Group, said he agrees there is significant market opportunity beyond the initial PC sale. He noted that DEC will be able to offer customized open systems integration and full service and support capabilities for any variety of DEC and competitors' equipment.

A key component in DEC's strategy is Pathworks, which links different architectures. A pact with Microsoft Corp. last fall resulted in Windows support under Pathworks.

"By riding on the coattails of Windows, DEC will emerge as the primary vendor of distributed systems software and proliferate its wide-area network products," said UBS Securities, Inc. analyst Marc G. Schulman in a report on DEC.

Pathworks also supports DOS, IBM OS/2 and Apple Computer, Inc. Macintosh environments — an integration scenario commodity PC suppliers just cannot deliver, Rose said.

In its latest stab at cracking the PC market, DEC initially positioned itself as a price leader, entering the market late last spring with a handful of aggressively priced Intel 80386- and I486-based PCs, with entry-level boxes starting at under $6,000. Since then, its pricing edge has dissipated, users and analysts said.

The DEC PC433, an Intel 486-based, 33-MHz machine, currently carries a price tag of $6,699, which most analysts agree is still undercut by pricing offered by other clone makers. Despite DEC's discounted mail-order campaign (see story below), its PCs still seem to be "a couple of hundred dollars over" prices charged by several other mail-order companies, said John Braucksieker, director of information systems at Protein Technologies, Inc.

Loyal users

If some users are disappointed with DEC's pricing, others — such as London Life Insurance Co. in London, Ontario, and the Cleveland Board of Education in Ohio — swear by DEC's integration techniques.

Tom Cagle, Cleveland's director of student IS, has more than 100 Intel-based PCs and Macintoshes linked across the school system via Pathworks to a hub of Vaxclusters at the central office. Cagle said DEC's size, expertise and support were critical in getting 1,500 users and several architectures to function as one network.

Richard L. Krohe, manager of technology architecture at London Life, was an early customer of DEC's desktop integration offerings starting back in 1987 with the predecessor to Pathworks. He said standardizing on a single vendor makes life easier on a network. "Our experience with clone technology taught us that there can be subtle differences in memory architecture, configuration files and other areas, which equals complications," Krohe said.

However, the loyalty of DEC's user base is unclear. "I don't sense that DEC has any particular competitive edge just because we are DEC customers," said Raymond V. Sasso, chief information officer at J. R. Simplot Co., a food processor for the fast-food industry.

The company must also prove itself to non-DEC shops, a rougher sale given the vendor's prior disastrous foray into the PC market and the timing of its current entry into a market that is nearing saturation.

Mark E. Horak, manager of litigation support at the international law firm of Fulbright & Jaworski, is currently using Novell, Inc.'s Netware to link 850 Compaq Computer Corp. PCs in the Houston area.

"Our decision was made last year, and we didn't consider DEC at all," he said.

Still, DEC could have an edge among customers that are looking for one-stop shopping and no finger-pointing, Goldberg said. "The relationships are there — DEC just has to exploit them."

ROSE SEEDS PC SUCCESS

According to John T. Rose, vice president of DEC's Personal Computing Systems Group, the company's success in the PC market will require the following:

- Support for all PC-standard network protocols and platforms via the DEC Pathworks and Teamlinks products.
- Continued relationships with Microsoft, Apple, Novell, Tandy and Olivetti, as well as upcoming partnerships with other parties both in the U.S. and international markets.
- Continuing with DEC's strategy of remarketing PCs at competitive street pricing.
- Offering comprehensive worldwide integration and support services for multivendor desktop environments.

The customers are through the mail

DEC is aggressively pursuing mail-order sales, along with several other distribution channels, in hopes of snaring sales in desktop hardware, software and services.

Desktop Direct, a catalog mail-order campaign, was formally launched last week. Now customers can catalog-order DEC's Intel-based PCs at prices 50% lower than previously available.

DEC has waffled on just how aggressively it will cut its PC prices, most recently stating it does not aspire to be the PC price leader. Instead, it plans to stay well within the 20% street price variance to remain competitive in hardware sales.

Raymond V. Sasso, chief information officer at J. R. Simplot Co. in Boise, Idaho, said he finds Desktop Direct "kind of interesting," but he questioned DEC's entry into an already mature market with thin profit margins.

"Sure, they have reduced their PC prices to reasonable levels, but they are not outstripping the competition by any means," observed Robert Cloninger, a six-year DEC customer and data processing manager at OK Industries, Inc. in Fort Smith, Ark.

Cloninger would only buy DEC PCs if the DOS support matches that for VMS, he said.

A DEC spokesman said the company will offer the support usually found at the mainframe level, drawing on the expertise of more than 20,000 employees dedicated to field service, support, training and consultation — a claim no other mail-order distributor can make. DEC is primarily targeting accounts where systems integration and adequate support are often issues.

Analysts remain skeptical, however. David B. Evancha, director of research at Workgroup Technologies, Inc. in Hampton, N.H., said, "Mail order attracts buyers with some level of PC expertise. Armed with this knowledge, they shop price."

DEC is not content to rest its channel distribution strategy on Desktop Direct. The company is also pursuing OEM, value-added reseller and specialty distributors, as well as piloting a program to establish a systems integration channel.

SALLY CUSACK

TRY, TRY AGAIN

Despite DEC founder Kenneth Olsen's oft-quoted questioning of who would want a computer on their desktop, DEC has made numerous attempts to break into the market

MAY 1982
- Professional 325 and 350, Rainbow 100 and DEC Mate II introduced

SEPT. 1986
- Vaxmate, a networked PC running VMS and MS-DOS, introduced

JAN. 1988
- Joint development deal launched with Apple to link Macintoshes and the Appletalk network with VAX systems and Decnet/OSI networks

SEPT. 1988
- DEC buys stake in Mips Computer Systems

JAN. 1989
- Decwindows and a family of industry-standard PCs introduced

OCT. 1990
- DEC 433 MP System, based on SCO Unix V and the Intel I486 processor, introduced

APRIL 1991
- DEC joins with Compaq and Microsoft to forge RISC-based desktop standard

MAY 1991
- Broadest set of DEC PCs unveiled, all optimized for networked computing. Includes 80386-based DECpc 333 portable and DECpc 320SX notebook, 486-based DECpc 433 and DECpc 433T PCs

NOV. 1991
- DEC and Microsoft announce an alliance allowing Microsoft's Windows to retrieve and exchange data with DEC's Pathworks LAN software

Developer's exit could further slow Repository

CONTINUED FROM PAGE 1

ect to fruition said they remain committed to making it work. However, observers said Uhlir's resignation sends out a strong signal that all is not well.

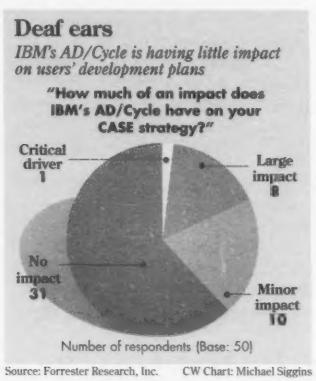
"It's significant when a key manager decides to leave at a critical point in the product's life," said Paul Hessinger, chief technology officer at Softlab, Inc. in Atlanta. "He's done some very good work, and it will be a loss."

One user who is close to the Repository project and knows Uhlir agreed that IBM has "lost a valuable asset" and a "star technician. But one person does has "cried Repository too often. I can only sell this to my senior management so many times. I have to be darn sure it works before I will try to sell it again."

Other users echoed Morrow's wait-and-see approach. "At one point, we were looking to use it, but we're not waiting with baited breath," said Michael Sztejnberg, vice president of technical services at Manufacturers Hanover Corp. in New York.

Still other observers questioned whether Repository will ever truly be ready for prime time. Among the technical issues are the following:

- Performance may not be quite up to snuff. "The underlying meta-meta model is inadequate," said Michael West, program director at Gartner Group, Inc. in Stamford, Conn. "It has to generate thousands of tables, and it becomes impossible from a performance perspective."
- The lack of immediate support for a client/server architecture, which has rapidly gained a foothold since IBM announced Repository in September 1989.
- The lack of Repository support from some of IBM's own CASE tools, including Cross System Product.


Deaf ears
IBM's AD/Cycle is having little impact on users' development plans
"How much of an impact does IBM's AD/Cycle have on your CASE strategy?"
Critical driver 1
Large impact 8
No impact 31
Minor impact 10
Number of respondents (Base: 50)
Source: Forrester Research, Inc.
CW Chart: Michael Siggins

not a project make."

The user said he is more concerned about the technical issues dogging Repository, most notably the lack of ability to manage several versions of an application, also called "versioning."

"I'm frustrated with IBM for not delivering versioning sooner but also with the third-party vendors for not delivering their products sooner," he said. "People bash IBM with some justification, but it's not all IBM's fault. The business partners haven't cooperated. They've been talking about it since 1989, but talk is cheap."

To date, only the financially troubled Knowledgeware, Inc. has a software package that keys to Repository Manager, although an Intersolv, Inc. product is due out in March.

"There are too many" companies developing Repository, said Ira Morrow, vice president of technical planning at Shearson Lehman Brothers in New York. "IBM has to lead and not just follow the pack."

Shearson, along with other business units of American Express Co., tested Repository Manager for about two years before returning the tapes to IBM. "We did not reject Repository; we just postponed it. We will look at it again when it's ready," Morrow said.

Still, he cautioned that IBM

Strong commitment

IBM and AD/Cycle business partner executives disagreed. "We're working as fast as we can," said Michael Ryan, senior vice president at Knowledgeware. "Our commitment remains strong. It's not an easy undertaking."

Jon Hemming, manager of market strategy in IBM's Programming Systems line of business, concurred. "I don't blame people for being skeptical, but I don't get the feeling that customers are disenchanted or are moving away from it," he said.

IBM plans to address the issue of a client/server Repository Manager with an OS/2 version that will not require a mainframe to operate, in addition to a local-area network version, he said.

Borland, Microsoft to take on Lotus

CONTINUED FROM PAGE 1

E. Seagrams & Sons, Inc. in New York. "It's always nice to have more than one choice."

Industry analysts said it is doubtful that either company could greatly damage Lotus' position.

"Lotus has an advantage because it's been in live, working situations," said Frank Dzubeck, president of Communications Network Architects, Inc. in Washington, D.C.

Microsoft is planning a product rollout based around a "messaging infrastructure," starting with Mail 3.0, which is scheduled for delivery in the second quarter. This will be followed by component software that will provide individual work-group functions, such as scheduling.

Development kit on tap

Microsoft also plans to promote its Messaging Application Programming Interface so developers can tailor applications to its infrastructure. A development kit is planned for shipment early this summer, said Laura Jennings, group product manager for work-group applications.

Borland, which is not ready to provide product information, claims that it will work to enhance existing applications for a group environment instead of delivering new groupware applications.

"The approach we plan is very different from Notes," said Ken Einstein, director of applications strategy at Borland. "It's based on opening up capabilities [of] existing platforms, rather than forcing [customers] to adopt a different type of product." Lotus' strategy has been to offer Notes as a comprehensive environment, complete with work-group functions, document management and development tools. This approach has won it some dedicated accounts that praise Notes and do not seem at all interested in what competitors have to say.

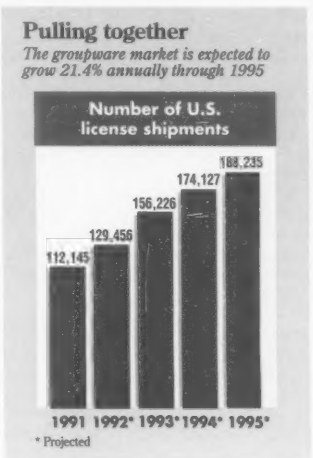
"Talk is cheap," said Sheldon Laube, national director of information and technology at Price Waterhouse, when asked about the Microsoft and Borland plans. "So far, I don't see anything. It's easy to take potshots, but Lotus' is the [only] one on the market you can buy."

David Marshak, a senior consultant at Patricia Seybold's Office Computing Group in Boston, said he expects each of the three companies to play up their individual strengths.

"I don't see them jumping in with the same kind of tools" as Lotus, Marshak said. "Notes does well at sharing and tracking. They have to position their products in a different space."

For example, he said he sees Microsoft focusing on work-flow functions and "the mail-enabled piece of it." Borland, Marshak said, "sees itself as [the provider of] data access." The company could be in a good position because work-group computing is about getting information to users.

Lotus executives shrugged off the Microsoft and Borland plans and said the claim that Notes is proprietary is just hot air. "They don't have anything to sell," said John Landry, a senior vice president and chief technology officer at Lotus. "It's really easy to talk about things that you don't have."



Massachusetts Blue Cross/ Blue Shield ails, tries EDS

CONTINUED FROM PAGE 1

Chief Information Officer is being created and will be shared by Blue Cross' current vice president of applications, Bob Hollinger, and EDS senior account executive Peter Carroll. Some 100 Blue Cross IS employees will report to Hollinger; the remaining 588 or so — EDS employees as of press time last week — will report to Carroll. At the board level, Carroll and Hollinger will act jointly as "the CIO."

While such a split could potentially strain the already divided loyalties inherent in an outsourcing contract, EDS and Blue Cross may be better positioned than most to make it work. "An organization the size of Mass. Blue Cross/Blue Shield can expect to wield a great deal of clout with EDS," noted Philip Lohman, director of research at First Consulting Group in Long Beach, Calif.

At the end of a 60-day evaluation, "some changes are expected," according to a memo issued to Blue Cross managers last week; however, several executives said, no major layoff is anticipated.

For now, all operations will remain in Boston. During the next 18 months, Joyce said, claims functions will be migrated to EDS systems and will be run out of EDS centers in Camp Hill, Pa., and Plano, Texas.

While Blue Cross is making the outsourcing move from a position of corporate strength — the nonprofit provider is about to post its third consecutive year of financial gains — the same can not be said of its information systems setup. Subscriber defections as well as administrative backlogs fueled work on a home-grown automation initiative, the so-called System 21 project.

One Blue Cross employee described System 21 last week as "a well-known cost-overrun fiasco for the last five or six years." By the time Blue Cross began to back away from the project about 18 months ago, an estimated $80 million had been poured into the hapless system, the last surviving elements of which are now being put to rest.

The outsourcing alternative, formerly considered and rejected by Blue Cross as too costly, reemerged this past fall, spearheaded by Joyce and Blue Cross Senior Vice President and Controller Joe Firmano.

Surprisingly, EDS' Lutz noted, health care has been relatively slow to prescribe technological cures for its notorious bureaucratic nightmares.

"Throughout the banking industry, you see extensive use of electronics in all sorts of communications and transfers," Lutz said. "In health care, by and large, it's still, 'Slap on a 29-cent stamp and walk it down to the mailroom.' "

That isn't how it is about to be at Blue Cross, Joyce said. First up under the new contract is a joint development project to "create a new definition of voice and data architecture, primarily to improve our customer service," he explained. First fruits of this effort should ripen by midspring, he added.

IBM stations seek high ground

BY MARYFRAN JOHNSON
CW STAFF

SAN FRANCISCO — IBM bounded back to the front lines of the Unix workstation wars last week with five new models of the RISC System/6000 line, a more user-friendly release of the AIX operating system and expanded Unix networking options, including Novell, Inc.'s Netware 3.1.1 for AIX/6000.

The announcement also provided a sneak preview of workstations to come. The new low-end Model 220 employs IBM's first single-chip reduced instruction set computing (RISC) processor — a harbinger of the technology to be used in the so-called Power personal computer coming in early 1993 from the partnership of IBM, Apple Computer, Inc. and Motorola, Inc.

That RISC processor will run a lighter version of AIX that contains a subset of functions most needed for desktop use, said Donna Van Fleet, director of IBM's Personal Systems Programming Center in Austin, Texas.

Dave Card, an analyst at International Data Corp. in Mountain View, Calif., said that with the expandable RS/6000 Model 220 color version, IBM is moving the "sweet spot" in the market for color workstations down from the $12,000 to $15,000 range to less than $10,000.

Only Sun Microsystems, Inc. offers a color workstation for less than $10,000 — the Sun IPX — but that is 2-year-old technology with lower performance ratings than IBM's new machines.

Also, the availability next month of Netware for AIX (priced from $5,500 to $25,000) will allow PCs on a local-area network to access an RS/6000 server.

Wausau Insurance Cos. in Wausau, Wis., is considering bypassing IBM'S LAN Manager and using Netware instead. However, Bob Denison, Wausau's open systems development manager, needs to know whether Novell will pledge to support the Open Software Foundation's Distributed Computing Environment (DCE) technology. "We want Netware to play in DCE."

A second network option, the High Availability-Network File Server, is said to enhance the ability to retrieve data via Sun's Network File System (NFS) from all types of network clients while mirroring NFS on a separate server as a backup.

When it comes to multiprocessing capabilities, however, IBM officials said it will be early 1993 before they can offer clustered multiprocessing in a distributed environment of RS/6000s. That could be too long a wait for some customers.

Wausau Insurance, for example, is maxed out on its RS/6000 Model 550 and needs more power than the 560 offers.

"We're looking at multiprocessing environments from other vendors now," Denison said. "That's the big advantage for open systems: You can move right up if you need to."

The new Powerstation and Powerserver models span the range from a 25-Specmark machine for $6,345 to an 89-Specmark system priced at $64,110. The new models represent 30% to 60% price/performance improvements over the current line.

Rather than strip its entry-level model, the 220, of sufficient memory to actually run applications, IBM configured all three versions of the Model 220 with 16M bytes of base memory and added integrated Ethernet, small computer systems interface capabilities and a special graphics adapter.

The high-end Model 560 gives IBM a 15% to 20% advantage in cost per transaction over rival Hewlett-Packard Co.'s Series 800 multiuser Unix systems, according to IBM.

With its $60,000 to $100,000 price range, the Model 560 falls into traditional high-end workstation brackets but is actually as powerful as a supermicrocomputer. It has an 89-Specmark rating and a clockspeed of 50 MHz and offers 30.5 million floating-point operations per second.

IBM is placing greater emphasis now on making AIX easier to install, maintain and use, according to Van Fleet.

To increase the RS/6000's allure to commercial mainframe customers, IBM's networking division is preparing to ship an early version this year of a key transaction processing monitor.

Powering up

IBM's new workstations give the company a price/performance boost in this highly competitive market

	Powerstation/220	Powerstation/350	Powerstation/560
Microprocessing speed	33 MHz	42 MHz	50 MHz
Performance	25 Specmarks	71.4 Specmarks	89.3 Specmarks
Memory	16M bytes	32M bytes	64M bytes
Disk storage	160M bytes	160M bytes	800M bytes
Monitor	Gray-scale monochrome	NA	NA
Price	$7,185	$26,790	$64,110
Availability	March	February	March

NA: Not available

Source: IBM

CW Chart: Janell Genovese

REPORTER'S NOTEBOOK

Unix systems vendors may be trying to convince IS executives that they are as serious and dependable as IBM, but they let it be known at the Uniforum conference in San Francisco last week that they also know how to have fun.

Sprinkled amid the various displays of so-called industrial-strength hardware and software were comedy acts, magic shows and downright general silliness for the sake of sales.

At **Wordperfect's** massive display, dozens of show-goers sat happily wearing maroon baseball caps emblazoned with "Wordperfect" as an exceedingly perky young woman ran them through the product paces. "How did she get them to put on those silly hats?" one passerby wondered aloud.

In the next aisle, **Data General** required users to wait in line for the chance to enter its booth. Now, was it the deep-dish pizza and the professional magic show? Or the chance to hear a pitch for the new reduced instruction set computing-based Aviion workstations?

Amdahl, meanwhile, put on a 15-minute mini musical extolling the benefits of Amdahl's mainframe computers running the UTS Unix operating system. Titled "The Open Enterprise," the show went on and on and on — all day long. It featured a man and a woman who burst into woeful song as their LAN traffic slowed and joyful melody as their imaginary car company's assembly line rolled along.

Users took it all in stride. "I'm here mostly to see what people are giving away. I'm looking for toys," declared Steve Harris, a senior software engineer at Eaton Corp. in Beverly, Mass. About 1,500 bypassed the floor to attend the keynote given by **Sun Microsystems** CEO Scott McNealy, who joked, "Don't any of you have jobs?"

He then poked fun at alliances of rivals such as **IBM** and **Apple** by using a Sun Sparcstation-based demo featuring a mock "reorg tool" that graphically depicted IBM munching on and then digesting the Apple.

Sun disclosed a development alliance of its own with **Cray Research**, which intends to build high-end Scalable Processor Architecture systems.

MARYFRAN JOHNSON AND JEAN S. BOZMAN

Spotlight on commercial Unix

BY MARYFRAN JOHNSON
CW STAFF

SAN FRANCISCO — Unix's struggle for the kind of legitimacy and acceptance in the commercial world that it has achieved in the scientific and technical one was the underlying theme of the Uniforum conference held here last week.

"Unix is bigger, broader and more accepted in the marketplace than ever before," Scott McNealy, Sun Microsystems, Inc.'s chief executive officer, said in his keynote speech. He was referring to the progress the environment has made in recent years.

Many of the 40,000 Uniforum attendees commented on the sheer number of Unix products demonstrated at the mostly upbeat show that either are available now or will ship in the next 30 days. These included applications development tools, interface development tools and fourth-generation languages.

"Last year, everyone was here to learn the basics, but this year it's a much more sophisticated crowd," said Judith Hurwitz, president of Hurwitz Consulting Group in Newton, Mass. Users asked tough questions about issues such as computer-aided software engineering frameworks and the standards needed to get tools to interoperate beyond the operating system into higher level integration concerns, Hurwitz added.

"This has become a very big show," said Michael Goulde, an analyst at Patricia Seybold's Office Computing Group in Boston. "Commercial buyers are definitely here. This move to Unix and open systems is not just hype," he added.

UniForum

The issues uppermost in users' minds seemed to center on ease of use, system scalability, sufficient security and interoperability between proprietary and open systems environments.

"Unix is trying to be all things to all people now, but it is not as robust as some of the proprietary operating systems," said Brian Anderson, director of information systems at Trans Ocean Ltd. in San Bruno, Calif., a Unisys Corp. Unix user.

Show-goers said they were seeing more examples of tools and utilities, but since they tended to address a couple of specific problems on specific platforms, they did not solve anything for the generic business user.

"We're committed to the best system to solve the problem," said David Bond, manager of support services at BP Oil Co. in Cleveland, which has 50 Digital Equipment Corp. VAX/VMS systems and three Unix systems from DEC, Encore Computer Corp. and Hewlett-Packard Co.

The recent purchase of an HP Series 800 multiuser Unix system was "the first time we've been able to purchase a system as a true commodity," Bond noted. "The thing ran our application the fastest and at the lowest cost."

Like many other commercial customers, BP Oil is concerned about the lack of sufficient operating system security for distributed Unix systems. "We will not make any heavy investments in Unix until the security problems are solved," Bond said. In the more secure world of VMS, for example, system managers can tightly control access to individual files — virtually an impossible task in Unix, he added.

Connecting MS-DOS and Unix environments was another topic that piqued a lot of user interest at Uniforum.

"I've noticed much more emphasis this year on the X Window environment and graphical user interfaces," said William Ramage, controller and system manager at the Alberta Heart Association in Calgary, Alberta.

Novell covers most Unix bases

BY JIM NASH
CW STAFF

Like beads on a string, Novell, Inc. continues to collect development agreements with Unix software vendors as part of an effort to provide Netware users with access to every major version of Unix.

"We want to make sure customers [that] use Unix in downsizing strategies are given the maximum number of options," said Kanwal Rekhi, Novell's executive vice president/general manager of the Interoperability Systems Group.

Novell is working with several partners to deliver on this promise. The allies include The Santa Cruz Operation, which last week licensed Novell's Internet Packet Exchange/Sequence Packet Exchange transport protocol; IBM, which is using Novell software to configure its RISC System/6000 as a Unix server; Sun Microsystems, Inc., with whom Novell developed a set of Netware loadable modules for Network File Services; and Unix System Laboratories, Inc., with whom Novell set up a venture called Univel to develop a Netware version for Unix.

Easier integration

For some network managers already faced with Unix and DOS networks, the accords mean an easier integration of the two. They could even present products that managers could use to move to Unix systems, according to network administrators.

However, other Novell users considering a Unix migration said they may be able to replace Netware and its Unix extensions with the networking features built into Unix.

Fred Winograd, director of computing planning at Merrill Lynch & Co. in New York, said that once Netware managers, particularly in large companies, begin using Unix at the server, they may make a wholesale move to Unix.

Ray Chandler, senior network consultant at Arco Oil and Gas Co. in Plano, Texas, concurred. He said Arco "is getting closer to linking Unix and our PC networks." Currently, the company is using Novell's LAN Workplace for DOS and Netware Network File Services. Chandler said Arco has chosen to bypass Netware for Unix because of its performance.

According to Winograd and others, it is difficult for end users to write their own Netware applications in the form of Netware loadable modules.

However, it is easier to develop client/server applications for Unix, said analyst David Passmore at Ernst & Young in Fairfax, Va., noting that there are more Unix development tools as well.

Also enticing is cosmetic surgery on the Unix interface that will make it easier for the less technically inclined to comprehend. Novell has made friendlier interfaces a priority in its development effort through Univel.

Unix's most notable advantage, according to Robert Cerny, manager of advanced development at Elkay Manufacturing Co. in Oak Brook, Ill., is the sheer number of manufacturing applications available for Unix. Novell's chief drawback is its need for numerous full-time network administrators, he said.

Novell's strategy is to make access between Unix and Netware as easy as possible. However, it is not making connections between the various versions of Unix. "We don't have the resources or the inclination," Rekhi said.

If there is any central fixture in this segmented effort, it may be the joint venture, Univel. It is charged with creating a new version of Unix that is optimized to take advantage of Netware features. That software would be a mirror image of Netware for Unix, which is Netware augmented to work on Unix.

Intel eyes chip differentiation

BY MICHAEL FITZGERALD
CW STAFF

SANTA CLARA, Calif. — Intel Corp. said last week it will introduce more than 30 varieties of its I486 and 80386SL products this year.

Intel's goal, according to Thomas Macdonald, marketing manager for the 386 and 486, is to "offer the products our customers want and not leave any available niches or holes for the competition to enter."

Analysts agreed, though, that Intel's main competitor, Advanced Micro Devices, Inc. (AMD), will be "uncrushable."

"There are more opportunities than Intel can tackle," said Erik Jansen, a senior analyst at Alex. Brown & Sons, Inc.'s San Francisco office. Intel will also introduce 3.3 V 386SLs and 486SLs this year.

"Intel is going to try to drown them in a tidal wave, but it's not going to work," agreed George Colony, president of market researcher Forrester Research, Inc. in Cambridge, Mass. He added that the AMD/Intel battle is "absolutely a boon for users: We're looking at 25-MHz 486SXs for under $2,000 by the end of the year."

Jansen said the proliferation of chips from Intel and others will "absolutely serve the market. The [traditional] market doesn't exist anymore — it is now many different markets."

Competing products

AMD said it would announce its plans for the 486 market on Thursday. Chips and Technologies, Inc., which late last year introduced its PC/Chip, a competitor in the 386 market, said it expects to continue providing products that compete with Intel, although it will exit the multiprocessing chip business.

Intel, meanwhile, outlined some of its future chip plans last week. The company announced a lower cost version of its 20-MHz 386SL chip that will not support external cache. This chip is in Compaq Computer Corp.'s new LTE Lite 386S/20 (see story page 4).

Next makes big play for key Intel desktops

BY JAMES DALY
CW STAFF

SAN FRANCISCO — Next, Inc. Chairman Steven Jobs put the high end of the personal computer market squarely in his sights at last week's Nextworld Expo when he announced a new version of the Nextstep operating system that will run on PCs equipped with Intel Corp. I486 microprocessors.

Nextstep 486 will sport the same capabilities as Nextstep 3.0, an updated version of the company's object-oriented operating system that features snazzy multimedia functions and sophisticated application development capabilities.

Jobs called the revamped Nextstep 486 the "Trojan horse" that will offer the widespread appeal needed to finally get the 7-year-old firm's foot in the door of corporate America. Market researcher Dataquest, Inc. estimated the installed base of 486-based computers to be approximately 2 million.

Next users said they also hope to see an application windfall as a result of Nextstep 486. "Anything that increases the number of people using Nextstep increases its appeal to developers, and that means more and better applications for me," said Eric Spahr, a vice president at New York-based Lehman Brothers Division who has equipped his traders with the Nextstation.

Jobs claimed it will not be difficult to port DOS applications over to Nextstep 486, but developers interviewed last week said it was too early to tell. The software is still in alpha testing.

Jobs *plots Nextstep's entree in Fortune 1,000*

However, the Redwood City, Calif.-based Next still faces pricing obstacles in selling to PC users.

In addition to shelling out $995 for the user version of Nextstep 486, a user may need extra circuit boards, additional memory and higher disk drive capacity to bring a typical PC up to the sophisticated color, sound and video capabilities of the Next machine — adding several thousand dollars to the cost of the PC.

DG, HP, D&B pact centers on Unix business programs

BY KIM S. NASH
CW STAFF

FRAMINGHAM, Mass. — In an effort to make their Unix systems more commercially appealing, Data General Corp. and Hewlett-Packard Co. last week disclosed that they are jointly developing business software with Dun & Bradstreet Software.

The trio will co-build client/server accounting and financial software for the DG Aviion and HP 9000 Series 800 lines.

The pact could sway some users to buy Unix machines from DG and HP, especially those sitting on the fence, concerned about the lack of compatible business software, observers said. It will also enable D&B Software to gain two significant platforms for its big push into open, client/server computing.

"Until this, we were considering Sun only, but now we'll look into DG and HP," said Ed Simmons, manager of technology implementation at Enron Corp., a gas pipeline company in Houston.

Users such as Enron will be able to integrate the new applications with existing mainframe-based D&B Software packages via Unix server software due out this year, according to Bob Cameron, director of client/server strategy at D&B Software.

The new products are expected to generate more than $1 million in 1992 sales for D&B Software. Multiphased delivery starts this year.

Enron is putting together a 30-user ad hoc financial reporting system to run with its existing IBM mainframe-based D&B Software packages. The company has already bought a database from Sybase, Inc. to act as the data repository, and it is now looking for Unix servers and workstations to connect to it, according to Simmons.

Such downsizing action is worrisome to D&B Software, which is reportedly the leading supplier of mainframe applications software, with an installed base of 12,000 sites worldwide.

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TRENDS

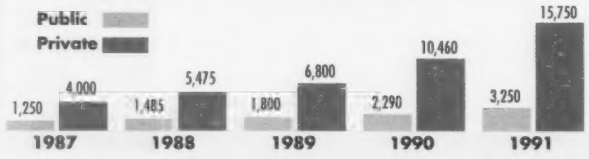
E-mail

Getting a recent boost from LANs, E-mail has moved from marginal use to the mainstream market since the early 1980s

E-mail growth

The popularity of E-mail across private networks is well-illustrated while E-mail traffic on public networks continues to inch along

U.S. mailbox installed base (in thousands)



Top 5 LAN E-mail software
(Year-end 1991 estimates)
Installed base (in thousands)

Vendor	Servers	Mailboxes
Lotus CC: Mail	50K	1,000K
Microsoft Mail		
PC Networks	25K	750K
Appletalk LANs	30K	250K
Da Vinci Email - Coordinator	15K	500K
	14K	350K
Banyan Network Mail	12K	450K

DID YOU KNOW?

In 1980, there were only 210,000 installed mailboxes on public networks and 220,000 on private ones, compared to 19.1 million in total now.

Top 5 U.S. public E-mail services (Year-end 1991 estimates)

Service	Mailboxes	Revenue
AT&T Easylink services		$95M
Easylink	200K	
AT&T Mail	120K	
Sprintmail	175K	$30M
MCI Mail	120K	$30M
GE Info. services		$30M
Quik-comm	100K	
Genie	300K	
BT Tymnet Dialcom	120K	$25M

Send me some E-mail

LAN-based E-mail software is on the rise: 5,400,000 mailboxes were in use at the end of 1991.

Source: Electronic Mail & Micro Systems, New Canaan, Conn.

CW Chart: Janell Genovese

NEXT WEEK

Though each of the milling machines it builds is unique, Ingersoll Milling Machine is exploiting information technology to streamline its products, says **George Hess**, vice president of systems and planning. Ingersoll is in the minority, however: Few U.S. companies look to IS to speed product development. See next week's Executive Report. ▶

Smart cards and memory cards, which have about the same dimensions as credit cards, are slowly gaining in popularity. The cards have built-in microprocessors and other circuitry that enable them to be used in a variety of applications, from controlling access to computers to storing vital data. Read about it in Advanced Technology next week.

INSIDE LINES

In play?

▶ Unisys' return to profitability (see story page 6) may not have been the only force late last week that sent the company's stock surging to more than $7 a share (a 52-week high). Speculation of an impending $10.75 per share takeover offer by a heretofore unknown company — HTIC — could well have played a roll in the run-up. Sources close to the company say Unisys employees are bracing for a hostile takeover, reminiscent of Burroughs' bearhug of Sperry Corp. (which formed Unisys in 1986). Insiders say Charterhouse Bank in the UK, which was said late last year to be organizing an international syndicate to acquire the company, could be behind the HTIC moniker. Unisys Chairman James Unruh declined comment.

Pulling in the horns

▶ A week after touting a new "customer-dedicated" reorganization of U.S.-based operations, Bull HN quietly sliced 300 workers from its ranks. The layoffs reportedly touched sales, administration and other positions at company headquarters in Billerica, Mass. No manufacturing or research and development staff lost their jobs, according to a source.

At long last

▶ More than a year late, DEC will finally release OSI-compatible Decnet for its VMS systems at this week's Comnet. The firm announced Decnet/OSI for Ultrix, but not for VMS, by its original deadline date of September 1990. DEC's Decnet/OSI (formerly named Decnet Phase V) for VMS is said to integrate proprietary Decnet and OSI protocols into one operating system environment. It is slated to ship in June.

Help on the way

▶ Those trying to choose a network management standard — SNMP, DME or assorted versions of OSI — may soon get some relief. A group of standards organizations that have been working to reach some kind of consensus on a network management standard are due to come out with a position statement at this week's Comnet. Included in the group are Corporation for Open Systems, several ISO bodies, SPAG, X/Open and the OSI Network Management Forum.

Not chopped liver

▶ While IBM mainframe and DEC VAX platforms are low on Lotus' priority list, Jim Manzi insists the company won't toss them aside. In fact, he said, new releases of 1-2-3 for both platforms will be announced in the first half of 1992. However, he also said that as far as these development efforts go, "There is no consumption of critical resources now. These are small development teams — 10 to 20 people."

Telespin control?

▶ Expect a complete OS/2 2.0 to ship by March's end, according to IBM officials who last week briefed the press during the first of what is bound to be many teleconference OS/2 updates. IBM also said it is making progress with fixes to some minor glitches on the limited-availability version that has been at customer sites for about a month. IBM also promised that beta code for the Windows seamless integration component would go out soon.

Rounding out the line

▶ Rumors of an impending IBM notebook abound in Europe, where a machine based on IBM's SLC chip is slated to be unveiled at the end of the month. Back in the U.S., although IBM was one of the first to announce an Intel 50-MHz I486-based product, it remains an upgrade board rather than a box. The company will trot out an actual 50-MHz box "when there is enough demand," according to an IBM official. When will that be? "Shortly," the official said.

Doug Michels, executive vice president of The Santa Cruz Operation, says he finds the reportedly large number of illegal SCO licenses in Eastern Europe to be kind of a left-handed compliment. "If they had to steal something, we're glad that they stole our software." Have a tip? Call, fax or Compuserve News Editor Alan Alper at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively.

Network tall buildings in a single bound.

With Chipcom's ONline™ System Concentrator you can connect a tall building or a far-flung campus with a seamless, unified and totally reliable network. A network that is truly self-healing, and capable of surviving multiple faults, from broken cable to failed modules or power supplies.

The ONline Concentrator is an intelligent wiring hub that handles all media, including coax, fiber and twisted pair. Its TriChannel™ architecture lets you configure up to three networks on each hub in any combination of Ethernet, Token Ring and FDDI.

Other network management systems merely allow you to perform an autopsy after your network has died. Chipcom's new Network Control System does much more: It provides instant CPR to keep your network alive by automatically rerouting itself around a failed component. And it lets you reassign, balance and reconfigure without setting foot in a wiring closet.

Using Chipcom's ONline System Concentrator as your network platform, you can build a network with the reliability, flexibility and manageability necessary to take it into the 21st Century.

And just think what a super hero that will make you.

BECOME A HERO.

Learn how to conquer the major causes of network failures. For your free copy call

1-800-228-9930.

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NETWORK RELIABILITY

CHIPCOM™

See us at Comnet Booth # 1068 and Networld Booth # 4717

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Three great reasons to buy dBASE now:

✓ 1. Borland's commitment to dBASE

✓ 2. Borland's commitment to technology

✓ 3. Borland's commitment to customers

Now that it's from Borland, you can buy dBASE® with total confidence. Simply stated, Borland is fully committed to delivering more power, more flexibility and better support to the whole dBASE applications development community.

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Because Borland is the leader in object-oriented technology, today's dBASE buyer will get more features and new dBASE releases in less time – such as SQL server links, event handling, object-oriented extensions to the dBASE language and compilers that generate fast, tight code.

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Borland is committed to meeting the full range of your applications development needs, providing the tools you need to create powerful data management applications today.

Call your dealer today or call 1-800-568-9092 now for more information.

BORLAND

Software Craftsmanship

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CODE: MP30

Computerworld Presents
"The 5th Wave"

To thank you for your time in filling out our survey, we'd like to send you a special gift. Featuring the best of our popular weekly cartoon series, "The 5th Wave," this full color calendar will entertain you all year long — and remind you that Computerworld is the most valuable information source in the IS industry.

Please allow 6-8 weeks for delivery.

The 5th Wave

"OOPS - HERE'S THE PROBLEM. SOMETHINGS CAUSING SHORTS IN THE MAINFRAME."

1992

JANUARY

1992

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
DECEMBER 1991 S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31			1 New Year's Day	2	3	4
5	6	7	8	9	10	11

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CODE: MP30

COMPUTERWORLD

A National Survey Of Information Systems Professionals

WE NEED YOUR HELP!

Dear Subscriber:

As part of our ongoing research to learn more about our subscribers, we have attached a survey. If you would take just a few moments to answer the questions on the postage-paid card below and return it to us, we would be most appreciative.

The information you provide will help us in our continuing effort to produce a quality publication for IS professionals.

Thank you,

Gary J. Beach

Gary J. Beach
Publisher

Complete survey and receive your FREE Cartoon Calendar.

Please read before beginning

This questionnaire will only take about ten minutes to complete. Please answer as completely as possible. If you aren't sure about an exact answer, please respond with your best estimate.

If you are unable to approximate or have no idea of an answer, simply leave the spaces for that question blank. However, if your actual answer is "0" or "None", be sure to indicate this rather than omit a response.

About Your Organization & IS Purchase Plans

1 What is the scope of your IS involvement?

14-1 ❑ Entire enterprise at all locations
2 ❑ Departments and/or divisions at more than one location
3 ❑ Departments and/or divisions at just one location
4 ❑ A single department
5 ❑ Other _____ *(Please specify)*

2 For how many locations do you specify, recommend, approve, or influence the purchase of IS products or services?

15-1 ❑ 1
2 ❑ 2 - 9
3 ❑ 10 - 19
4 ❑ 20 - 49
5 ❑ 50 - 99
6 ❑ 100 +

3 In the columns below, please indicate how many people:

A) Are employed, in total, at the location(s) you are involved with.

B) Are employed as IS personnel at these locations.

	A All Employees	B IS Personnel
Fewer than 10	❑ 16,17-1	❑ 18,19-1
10 - 24	❑ 2	❑ 2
25 - 49	❑ 3	❑ 3
50 - 99	❑ 4	❑ 4
100 - 249	❑ 5	❑ 5
250 - 499	❑ 6	❑ 6
500 - 999	❑ 7	❑ 7
1,000 - 2,499	❑ 8	❑ 8
2,500 - 4,999	❑ 9	❑ 9
5,000 - 9,999	❑ 10	❑ 10
10,000 or more	❑ 11	❑ 11

For the remainder of this survey, "your location(s)" refers to the number of locations you indicated an involvement with in Question 2.
For example, if you indicated involvement with 2 - 9 locations, you would answer Question 4 for the number of employees at those and only those locations.

4 Do you expect the number of IS personnel to increase, stay the same, or decrease for next year?

20-1 ❑ Increase
2 ❑ Stay the same
3 ❑ Decrease

5 What is the total external IS spending on hardware, software, networking, and outside contracted services in which you are personally involved for the current year (excluding payroll and overhead)?

21-0 ❑ Less than $500,000
1 ❑ $500,000 - $999,999
2 ❑ $1 million - $4.9 million
3 ❑ $5 million - $9.9 million
4 ❑ $10 million - $24.9 million
5 ❑ $25 million - $49.9 million
6 ❑ $50 million - $99.9 million
7 ❑ $100 million - $249.9 million
8 ❑ $250 million - $499.9 million
9 ❑ $500 million or more

6 How do you expect the spending level above to change in your next budget year?

Increase by ____ % (22-) Decrease by ____ % (23-)

7 When does your budget year end?

Month ____ (28-) Day ____ (30-)

8 Who do you consider your primary current vendor and who would you expect to be your primary vendor one year from now for each of the product types below?

	Primary Current Vendor	Primary Future Vendor
PCs		
Workstations		
Midrange Systems		
Mainframes		
Networking		
Application Software		
DBMS		
CASE/Application Development		
Outside Services		

9 For each of the products/services listed below, please complete as follows:

In Column A:
Please give your best estimate of how many of each type of product are *currently in use* at the location(s) you are involved with.

In Column B:
Write in the letter next to the range in the box to the right that includes your best estimate of the *amount to be spent at the location(s) you are involved with* during the next twelve months on each product or service.

In Column C:
Check *if you are involved* in recommending, specifying, or authorizing the purchase of products/ services of this type.

Spending Table
Range
A. None
B. Less than $25,000
C. $25,000 - $49,999
D. $50,000- $99,999
E. $100,000-$249,999
F. $250,000-$499,999
G. $500,000-$999,999
H. $1,000,000 - $4,999,999
I. $5,000,000 or more

	A In Use At My Location(s) Quantity	B Planned Spending Letter	C Recommend/ Authorize Yes
COMPUTERS			
PCs			
Desktop IBM Compatible PCs	32-	120	❑ 139
Notebook/Laptops	37-	121	❑ 140
Apple Macintosh	42-	122	❑ 141
Other PCs	47-	123	❑ 142
Workstations			
RISC-Based	52-	124	❑ 143
Motorola 680x0-Based	57-	125	❑ 144
Intel-Based	62-	126	❑ 145
Proprietary-Chip-Based	67-	127	❑ 146
SERVER/MID-RANGE/MAINFRAME			
Servers	88-	129	❑ 148
IBM Mid-range (AS/400, S/3x)	91-	130	❑ 149
VAX VMS-based computers	94-	131	❑ 150
Unix /Mid-range computers	97-	132	❑ 151
Other /Mid-range computers	100-	133	❑ 152
IBM/PCM Mainframes	107-	135	❑ 154
Other Mainframes	110-	136	❑ 155
Supercomputers/ MiniSupers/ Parallel Processors	113-	137	❑ 156

	A In Use At My Location(s) Quantity	B Planned Spending Letter	C Recommend/ Authorize Yes
NETWORKING EQUIPMENT			
Local Area Networks	159-	190	❑ 206
Modems over 9.6kbps (V.32, V.42)	161-	191	❑ 207
T1, Fractional T1, & T3 Multiplexors	164-	192	❑ 208
PBXs	167-	193	❑ 209
Switches (Data Packet, Matrix)	170-	194	❑ 210
Frame Relay	173-	195	❑ 211
Bridges, Routers, Gateways	176-	196	❑ 212
FAX Boards	179-	197	❑ 213
Network Adapter Cards	182-	198	❑ 214
	In Use Yes		
VSAT	❑ 185	199	❑ 215
Satellite	❑ 186	200	❑ 216
Wiring Hubs/ Cabling	❑ 187	201	❑ 217
Wireless LAN Products	❑ 188	202	❑ 218
LAN Testing Equipment	❑ 189	203	❑ 219

PERIPHERALS	A In Use At My Location(s) Quantity	B Planned Spending Letter	C Recommend/ Authorize Yes
Impact Printers (Mainframe/Mini)	222-	259	❑ 322
Impact Printers (Desktop)	227-	260	❑ 323
Laser/Inkjet Printers (30+ Page/Min)	232-	261	❑ 324
Laser/Inkjet Printers (<30 Page/Min)	237-	262	❑ 325
Color Printers	242-	263	❑ 326
Disk Drives (Mainframe/Mini)	247-	264	❑ 327
Disk Drives (Desktop)	252-	265	❑ 328
CD-ROM Drives	257-	266	❑ 329
Diskless Workstations	262-	267	❑ 330
X-Terminals	267-	268	❑ 331
Terminals (other)	272-	269	❑ 332
Tape Drives	277-	310	❑ 333
Mini/Mainframe/ Uninterruptible Power Systems	282-	311	❑ 334
PC LAN/Uninterruptible Power Systems	287-	312	❑ 335

OUTSIDE SERVICES
Do you contract with an outside firm for:

	In Use Yes		
Systems Integration Services	❑ 292	314	❑ 337
Facilities Management *(all/part of IS Operations)*	❑ 293	315	❑ 338
Contract Programming/ Consulting	❑ 294	316	❑ 339
Software Support/ Training	❑ 295	317	❑ 340
Network Installation/ Management/ Maintenance	❑ 296	318	❑ 341
Mainframe/Mini Maintenance	❑ 297	319	❑ 342
Workstation/PC Maintenance	❑ 298	320	❑ 343

10 CENSUS OF IS PROFESSIONALS

For each of the following areas that apply to your company, please:

A) List the name and title of the person responsible for that area

B) Check whether or not they are at your location.

Info Systems Mgt (CIO/VP MIS) — **At your location**

_____ *Person responsible*

_____ *Title* ❑ 345

Enterprise Networking

_____ *Person responsible*

_____ *Title* ❑ 346

End User Computing (PC/Workstation)

_____ *Person responsible*

_____ *Title* ❑ 350

To continue, please turn page.

MWGA2

NEWSPAPER

#63D#**********5-DIGIT 48103
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SECOND CLASS

About Applications

1 For each of the three processor environments listed below, please complete as follows:

Check all that apply in each column.

	Mainframe A: In Use at my Location(s)	Mainframe B: Plan to Purchase/License within 12 months	Mainframe C: Recommend/Authorize	Mini/Mid-Range A: In Use at my Location(s)	Mini/Mid-Range B: Plan to Purchase/License within 12months	Mini/Mid-Range C: Recommend/Authorize	Workstation/PC/LAN A: In Use at my Location(s)	Workstation/PC/LAN B: Plan to Purchase/License within 12 months	Workstation/PC/LAN C: Recommend/Authorize
Database Management/4GL	❑ 352	❑ 376	❑ 400	❑ 424	❑ 448	❑ 472	❑ 496	❑ 520	❑ 544
CASE	❑ 353	❑ 377	❑ 401	❑ 425	❑ 449	❑ 473	❑ 497	❑ 521	❑ 545
Project Management	❑ 354	❑ 378	❑ 402	❑ 426	❑ 450	❑ 474	❑ 498	❑ 522	❑ 546
System Performance Monitoring	❑ 355	❑ 379	❑ 403	❑ 427	❑ 451	❑ 475	❑ 499	❑ 523	❑ 547
Utilities, Languages	❑ 356	❑ 380	❑ 404	❑ 428	❑ 452	❑ 476	❑ 500	❑ 524	❑ 548
Network Management	❑ 357	❑ 381	❑ 405	❑ 429	❑ 453	❑ 477	❑ 501	❑ 525	❑ 549
E-Mail Software	❑ 358	❑ 382	❑ 406	❑ 430	❑ 454	❑ 478	❑ 502	❑ 526	❑ 550
EDI	❑ 359	❑ 383	❑ 407	❑ 431	❑ 455	❑ 479	❑ 503	❑ 527	❑ 551
Connectivity (PC-to-Mainframe Links, etc.)	❑ 360	❑ 384	❑ 408	❑ 432	❑ 456	❑ 480	❑ 504	❑ 528	❑ 552
Inventory Control/Process Control/MRP II	❑ 361	❑ 385	❑ 409	❑ 433	❑ 457	❑ 481	❑ 505	❑ 529	❑ 553
CAD/CAM/CAE	❑ 362	❑ 386	❑ 410	❑ 434	❑ 458	❑ 482	❑ 506	❑ 530	❑ 554
Engineering/Scientific	❑ 363	❑ 387	❑ 411	❑ 435	❑ 459	❑ 483	❑ 507	❑ 531	❑ 555
Office Automation/Word Processing	❑ 364	❑ 388	❑ 412	❑ 436	❑ 460	❑ 484	❑ 508	❑ 532	❑ 556
Imaging	❑ 365	❑ 389	❑ 413	❑ 437	❑ 461	❑ 485	❑ 509	❑ 533	❑ 557
Multi-Media	❑ 366	❑ 390	❑ 414	❑ 438	❑ 462	❑ 486	❑ 510	❑ 534	❑ 558
Desktop Publishing	❑ 367	❑ 391	❑ 415	❑ 439	❑ 463	❑ 487	❑ 511	❑ 535	❑ 559
Graphics	❑ 368	❑ 392	❑ 416	❑ 440	❑ 464	❑ 488	❑ 512	❑ 536	❑ 560
Accounting	❑ 369	❑ 393	❑ 417	❑ 441	❑ 465	❑ 489	❑ 513	❑ 537	❑ 561
Human Resources/Payroll	❑ 370	❑ 394	❑ 418	❑ 442	❑ 466	❑ 490	❑ 514	❑ 538	❑ 562
Sales and Marketing	❑ 371	❑ 395	❑ 419	❑ 443	❑ 467	❑ 491	❑ 515	❑ 539	❑ 563
Decision Support/Executive Info Systems	❑ 372	❑ 396	❑ 420	❑ 444	❑ 468	❑ 492	❑ 516	❑ 540	❑ 564
Spreadsheet & Financial	❑ 373	❑ 397	❑ 421	❑ 445	❑ 469	❑ 493	❑ 517	❑ 541	❑ 565
Statistical Analysis	❑ 374	❑ 398	❑ 422	❑ 446	❑ 470	❑ 494	❑ 518	❑ 542	❑ 566
Expert Systems/Artificial Intelligence	❑ 375	❑ 399	❑ 423	❑ 447	❑ 471	❑ 495	❑ 519	❑ 543	❑ 567

About Operating Systems/Environments

1 Check all that apply in each column.

OPERATING SYSTEMS	A: In Use At my Location(s)	B: Plan to Implement / Expand Within 12 Months
MVS	❑ 570	❑ 592
DOS/VSE	❑ 571	❑ 593
VM	❑ 572	❑ 594
OS/400	❑ 573	❑ 595
Other IBM	❑ 574	❑ 596
VAX VMS	❑ 575	❑ 597
UNIX	❑ 576	❑ 598
PICK	❑ 577	❑ 599
Microsoft Windows	❑ 578	❑ 600
IBM Presentation Manager	❑ 579	❑ 601
MS-DOS, PC-DOS	❑ 580	❑ 602
OS/2, OS/2 Extended Edition	❑ 581	❑ 603

	A: In Use At my Location(s)	B: Plan to Implement / Expand Within 12 Months
Macintosh OS	❑ 582	❑ 604
Other *(Please specify:)*		
588	❑ 583	❑ 605
LAN OPERATING SYSTEMS		
Novell Netware 286	❑ 584	❑ 606
Novell Netware 386	❑ 585	❑ 607
3 Com 3+ System	❑ 586	❑ 608
Apple LocalTalk	❑ 587	❑ 609
IBM LAN Server	❑ 588	❑ 610
Microsoft LAN Manager	❑ 589	❑ 611
Banyan Vines	❑ 590	❑ 612
Other *(Please specify:)*		
589	❑ 591	❑ 613

2 Please check if you are personally involved or expect to be involved in purchasing the following computer network capabilities within the next twelve months:

	Currently Involved	Will be within next 12 Months
	1	2
Inter-Networking: (LANs to other LANs or to WANs)	❑	❑ 614
Inter-Operability: Building networks across computers of different platforms	❑	❑ 615

Background

1 What is the name of your parent company?

2 Are you at the sole location of your company/organization?

652-1 ❑ Yes 2 ❑ No

3 What is your title/function? *(Check only one)*

IS/MIS/Management

653.4-1 ❑ Chief Information Officer, Vice President, Assistant VP, IS/MIS/DP Management
2 ❑ Director/Manager MIS Services, Information Center
3 ❑ Director/Manager Tech. Planning, Administrative Services, Data Communications, Network Systems Management, Director/Manager PC Resources
4 ❑ Director/Manager Systems Development, Systems Architecture
5 ❑ Manager/Supervisor of Programming, Software Development
6 ❑ Programmer, Software Developer
7 ❑ Systems Integrator, VARs, Consulting Management

Other Company Management

8 ❑ President, Owner, Partner, General Manager
9 ❑ Vice President, Assistant VP
10 ❑ Treasurer, Controller, Financial Officer
11 ❑ Engineering, Scientific, R&D, Tech Manager
12 ❑ Sales & Marketing Management

Other Professionals

13 ❑ Medical, Legal, Accounting Management
14 ❑ Educator, Journalist, Librarian, Student
15 ❑ Other *(Please specify:)*

4 Which of the following best describes your organization's primary business or industry? *(Check only one.)*

655.8-1 ❑ Manufacturer *(other than computers)*
2 ❑ Manufacturer of Computers, Computer-related systems or Peripherals
3 ❑ Finance/Insurance/Real Estate
4 ❑ Medicine/Law/Education
5 ❑ Wholesale/Retail/Trade
6 ❑ Business Service *(except DP)*
7 ❑ Government State/Federal/Local
8 ❑ Communications Systems/Public Utilities/Transportation
9 ❑ Mining/Construction/Petroleum/Refining/Agriculture
10 ❑ System Integrators, VARs,Computer Service Bureaus, Software Planning & Consulting Services
11 ❑ Computer/Peripheral Dealer/Distr./Retailer
12 ❑ Other *(Please specify:)*

5a Is label address correct as shown? If not, please revise in space below.

5b Is label address a home or business?

650-1 ❑ Home 2 ❑ Business

5c Please provide information below, if not on label. (THIS WILL NOT AFFECT DELIVERY OF YOUR SUBSCRIPTION.)

Name/Title

Company

Company Address

City/State/Zip

Business Tel

Thank you for your participation in this study!
Please fold and tape your survey form closed so return address shows and drop it in the mail.

Tape here for mailing. Fold here for mailing. Tape here for mailing.

Fold here for mailing.

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

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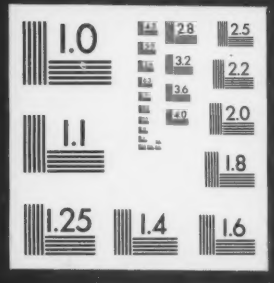
Framingham, MA 01701-9871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